



Defending the Planet One Beat at a Time

FAX TRANSMITTAL SHEET

TO:	Mr. Bob Johnson Regional Director Bureau of Reclamation Lower Colorado Region	Mr. Rick Gold Regional Director Bureau of Reclamation Upper Colorado Region
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FAX NO.:	702-293-8156	801-524-3858
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PHONE NO.:

FROM: **Marc A. Ross**
Executive Director

DATE: **November 22, 2005**

TOTAL NO. OF PAGES: **_9_, INCLUDING COVER SHEET**

COMMENTS:

Attached please find our comments to the Notice of Intent to prepare an EIS for the Development of Management Strategies for Lake Powell and Lake Mead Under Low Reservoir Conditions

ORIGINAL TO FOLLOW BY MAIL: YES ☒ NO ☐

**IF THERE IS ANY PROBLEM WITH THIS TRANSMISSION,
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Defending the Planet One Beat at a Time

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November 22, 2005

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**RE: NOTICE OF INTENT TO PREPARE AN EIS FOR THE
DEVELOPMENT OF MANAGEMENT STRATEGIES FOR LAKE
POWELL AND LAKE MEAD UNDER LOW RESERVOIR
CONDITIONS [BCOO-1000; ADM-5.10]**

Dear Regional Directors:

Advisory Board

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Engene, OR

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Oakland, CA

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Berkeley, CA

Bob Hollis
El Dorado Hills, CA

Bob Lippman
Castle Valley, UT

Jason Mastrine
Portland, OR

Rock the Earth ("RtE") is a Colorado nonprofit corporation with a national membership of concerned citizens. Like many other Americans, RtE members rely on the Colorado River Basin for a multitude of needs. RtE Members regularly seek the peace, quiet, and solitude of the national public lands for recreational, artistic, naturalist, and spiritual activities, including but not limited to hiking, camping, non-motorized water sports, photography, and meditation. Our members utilize the Colorado River as a source for drinking water as well as recreational activities and will be directly affected by the forthcoming Management Strategies for Lake Powell and Lake Mead under low reservoir conditions (the "Plan") as it will allow for changes in the way that the Colorado River is managed.

We appreciate this formal opportunity to comment on the matter of Colorado River Reservoir management, as we believe that an expanded, comprehensive, coordinated and forward-looking study and action plan for water management in the Colorado Basin is mandated by significantly changed, problematic conditions and needs. These include, but are not limited to, changing climatic and hydrological conditions, overallocation of the Colorado's water resources, outmoded legal and



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administrative water rights infrastructures, increasingly expanding demands on the system, inequities and waste regarding Colorado River water appropriations, storage and delivery, overdeveloped and inefficient Colorado River water storage and delivery systems, continuously degrading ecological systems and health, increasing water pollution and salinity, the utter lack of planning regarding sedimentation and its effects (including the likelihood of reaching "deadpool" conditions at Lake Powell, hereafter referred to as Powell Reservoir), and the ongoing inability to bring the system into compliance with a number of environmental mandates. The Colorado River water management infrastructure is largely outmoded, unsustainable, and unable to accomplish even its originally intended purposes, under present and anticipated conditions. It fails to adequately address shortages and changing hydrological and climatological conditions, and exacerbates the already severe ecological impacts of the structural system.

Rock the Earth originally filed these comments with the Bureau on August 29, 2005, prior to the Bureau's decision to pursue an EIS and prior to the September 30, 2005 notice in the Federal Register regarding the same. Rock the Earth reasserts the following in response to the Bureau's request for Scoping comments in preparation of an EIS to address this important issue.

Observations.

1. Diminishing returns and system inefficiency.

It is well documented that the historical average run-off in the Colorado is lower than the figure upon which the Colorado River Compact is predicated (1). Water from the Colorado is overallocated by at least 11% above the 400 year average (2). Rapid development in the Upper Basin has diminished the availability of surpluses, and the situation is further exacerbated by documented climatic change and resulting drought in the Western United States (3). Colorado River flows are expected to continue to decline (4). Even prior to the present drying trend, studies predicted the Colorado system would fail on the supply side by the year 2000 (5).

Compounding the problem and trend are factors involving the inefficiency of the system, due to tremendous evaporation losses (6). Under present scenarios, storage exceeds an "optimal," efficient level by 100% (7, 8). Because of this, the chances of Powell Reservoir filling again in the near future are negligible (9). It should also be noted that power generation is also compromised by, and may be discontinued by, continual low reservoir levels (10). Sedimentation is also reducing storage capacity and the system's lifespan at a rapid rate (11, 12). Draining Powell Reservoir as a rational response to these trends and problems would not jeopardize long term water delivery commitments to the Lower Basin (13).

2. Ongoing ecological degradation.

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The environmental changes and decline in ecological health of the system are well documented (14). Powell Reservoir has not only inundated hundreds of miles of natural and free-flowing river ecologies and resources, but has also disrupted the riparian and riverine ecology of Grand Canyon National Park, with the erosion of beaches, changes in water characteristics, and extirpation and endangerment of approximately 6 species of fish(15). Present mitigation efforts to protect endangered species are failing (16), and the ecological impacts and disruptions under present infrastructure and management have devastated the formerly productive Colorado River delta (16). Present infrastructures, management strategies and agency priorities have raised ongoing issues regarding the inability of the Bureau of Reclamation to bring the system into compliance with the Endangered Species Act, the Clean Water Act, the Grand Canyon Protection Act, the Archeological and Historical Protection Act, the Colorado River Storage Project Act, and the National Environmental Policy Act(17).

Additionally, salinity and the accumulation of toxic materials and metals are increasing due to evaporation, leaching and sedimentation, resulting in water quality degradation, large scale agricultural damage, increased costs and compromised ecological systems and health (18). Human recreational and commercial uses, along with motorized recreation activities, have polluted the waters of the Colorado River with petroleum products and waste, and with harmful bacteria and coliforms (19).

The full scope of systemic impacts and management options for the Colorado River has never been properly addressed, and environmental studies have been unduly limited and narrowed (20).

3. Recreation and Tourism.

The factors noted above have also had a direct impact on recreational resources and tourism, as visitation to Glen Canyon NRA (Lake Powell) has been consistently declining (by nearly 50 percent over the past 15 years) (21), while reservoir navigation has become problematic, marina facilities have been closing, and Park Service costs for maintaining access have been increasing (22).

4. Safety.

In 1983 and 1984 high flows and a lack of adequate planning and management for flood control caused a near catastrophic occurrence/failure at Glen Canyon Dam. Spillway failure from the high flows required lowering releases, nearly causing overtopping of the dam by the rising, impounded waters; only a temporary, 8 foot plywood barrier prevented overtopping (23). The maximizing of power revenues and political pressure from the Colorado Basin states and recreational interests to maintain Powell Reservoir as full as possible seriously compromise flood control needs and priorities, as well as safety. Although recent hydrological studies indicate that the filling of Powell Reservoir is unlikely in the near future, a dam failure would result in the overtopping of Hoover Dam and all other downstream facilities, destroying water

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delivery systems and inundating communities in Arizona and California (24). The elimination of Powell Reservoir will actually increase flood control capability of the system, as Mead Reservoir levels would be drawn down to provide for Lower Basin water uses (25).

Recommendations.

Rock the Earth submits that the present, crisis situation provides an unprecedented opportunity for articulation and implementation of long-overdue changes in the management paradigm. Present and anticipated conditions and experience call for a new vision, and a goal of balancing present and future hydrological, ecological, social and technological realities with system resources and management options, through the development of a comprehensive plan for sustainable Colorado River water management.

1. A comprehensive and synergistic environmental impact statement should be immediately undertaken and placed on a fast track for implementation of sustainable water management and sound ecological practices. Management of the diverse interests and resources of the Colorado River must be coordinated and balanced in a long range view and plan. 1
2. The option of decommissioning Powell Reservoir should be fully examined (with a report and recommendation to Congress to remove any political impediments to this necessity) in a cost-benefit context, in terms of system and management inefficiencies, water losses, ecological impacts, and other externalities and diminishing returns. Issues surrounding the implementation of this option should be articulated, and solutions/alternatives crafted based upon defensible science and documented hydrological and climatological factors. 2
3. Maintain and manage Hoover Dam and Mead Reservoir as the primary storage and flood control facility in the system. Mead storage capacity is more than adequate to safeguard and provide the Lower Basin's "perfected rights." A fully maintained Mead allows for ecological restoration of Glen Canyon, Grand Canyon, and the Colorado delta, and is more efficient in terms of water and power delivery than two partially filled reservoirs. Mead is also better sited for implementing sediment transport access and technical solutions than Powell, and the removal of Powell Reservoir will decrease salinity and pollution impacts to the system, while increasing available water supply. 3
4. Bank any surplus water flows (enhanced by removal of Powell) in underground aquifers, accessible by existing aqueducts, most notably in Arizona (but also considering Utah, Nevada and California possibilities), for simple retrieval when needed. In addition to mitigating the evaporation loss problem, incidental benefits from such banking would 4

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inure to areas presently plagued with groundwater mining, subsidence, falling water tables, rising pumping costs, and habitat losses. These aquifers would also provide much more long-term storage capacity than reservoirs.

5. Implement aggressive water conservation strategies in the Colorado Basin, considering equity (Tribal and Mexican rights, balanced water priorities and uses, and fair allocations) efficiency, sustainability and growth issues. 5
6. Study and make firm recommendations to facilitate the updating and transformation of Western water law and the "Law of the River" to reflect the river system's limitations, present and anticipated future conditions, and the interests of sustainability, conservation, ecological health, and equity. The concepts of senior appropriators, beneficial use, and non-use triggered lapses need to be reassessed and replaced with a sustainable, conservative water management and allocation paradigm that recognizes and balances ecological and instream uses/benefits with sustainable and equitable water allocations and deliveries. 6
7. Embark on realistic and now-feasible restoration projects in the Colorado Basin. Glen Canyon has shown to be capable of short-term restoration through documented sediment transport. Recreational opportunities on a restored river system would offset the loss of the flatwater recreational economy of Powell Reservoir. Tribal interests (sacred sites, religious freedom, archaeological protection, etc.) would be respected and enhanced by restoration. Restoration efforts for Grand Canyon would require more creative and diligent efforts due to the complexity and cost of sediment transport and the potential problems involving environmental quality; however, a free-flowing Colorado through the Grand Canyon would provide the most hope and opportunity for species recovery and habitat restoration. Eliminating evaporative water losses and managing water delivery through banking and a single primary reservoir (Mead), will free up sufficient water for delta restoration, while providing a greater measure of equity and guarantee for Mexican interests as recognized by Treaty and Compact. 7
8. Study and develop plans for sediment transport/removal from Glen Canyon, Mead Reservoir and other impoundments. 8

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Again, Rock the Earth appreciates this opportunity to comment on this matter of such critical importance and impact. The failure to plan for a sustainable future for the American Southwest will result in devastating and insurmountable problems and contention; the vision to overcome political inertia and confront the challenges of climate change, unsustainable growth and declining environmental quality may allow us as a society and species to move towards the hope of a sustainable future.

For Rock the Earth:



Bob Lippman
Member, Advisory Board

Marc A. Ross
President & Executive Director

C: [Governors Offices of the 7 basin states]
[Secretary of the Interior]
[Colorado River Commissions of the United States, and Mexico]
[Organizations concerned with the Colorado River, Western water and sustainability,
etc. (Glen Canyon Inst., Living Rivers, Friends of the River, etc.)]
[Selected media (High Country News, Sierra, etc.)]

Notes.

1. Stockton, C. W., and G. C. Jacoby. "Long Term Surface Water Supply and Stream Flow Trends in the Upper Colorado River Basin," Lake Powell Research Project Bulletin No. 18 (University of California at Los Angeles, Institute of Geophysics and Planetary Physics, 1976; Bureau of Reclamation, Upper Colorado Region: Water Operations. "Table LC-1 and UC-1." Colorado River System Consumptive Uses and Losses Report (1971 - 2000).
2. See Note 1 (Stockton).
3. Bureau of Reclamation, Upper Colorado Region: Water Operations. "Operations Summary and Reservoir Status." Annual Operating Plan for the Colorado River System Reservoirs (2000 - 20006); Christensen, Niklas, Andrew Wood, Nathalie Voisin, Dennis Lettenmaier, and Richard Palmer. The Effects of Climate Change on the Hydrology and Water Resources of the Colorado River Basin (2004).
4. See Note 3 (Christensen).

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5. Government Accounting Office. Comptroller General's Report to the Congress. Colorado River Basin Water Problems: How to Reduce Their Impact. CED-79-11 (1979).
6. See Note 1 (Bureau of Reclamation).
7. Langbein, Walter B. Water Yield and Reservoir Storage in the United States. U. S. Geological Survey Circular No. 409 (1959).
8. Bureau of Reclamation. Upper Colorado Region: Water Operations. "Upper Colorado River Tributaries." Colorado River System Consumptive Uses and Losses Report (1996 - 2000); Bureau of Reclamation. Upper Colorado Region: Water Operations. 24 Month Study Reports.
9. See Note 3 (Christensen).
10. Myers, Thomas. Sediment Hydrology on the Colorado River: The Impacts of Draining Lake Powell. Glen Canyon Institute (1999).
11. Andrews, Edmund D. "Sediment Transport in the Colorado River Basin." Colorado River Ecology and Dam Management: Proceedings, May 24-25, 1990, Santa Fe, NM (Academy Press, Washington, D.C. (1991).
12. Myers, Thomas. Water Balance of Lake Powell: An Assessment of Ground Water Seepage and Evaporation. Glen Canyon Institute (1999); See also Note 10.
13. Morrison, J.I., S.L. Postel, and P.H. Gleick. The Sustainable Use of Water in the Lower Colorado River Basin. Pacific Institute, and Global Water Policy Project, joint report (November, 1996); See also Miller, Scott K. Undamming Glen Canyon: Lunacy, Rationality, or Prophecy? 19 Stan. Env'tl.L.J. (2000).
14. See, e.g., Citizens Environmental Assessment (CEA) on the Decommissioning of Glen Canyon Dam: Report on Initial Studies. Glen Canyon Institute (December, 2000); The One Dam Solution: Preliminary Report to the Bureau of Reclamation on Proposed Reoperation Strategies for Glen Canyon and Hoover Dams Under Low Water Conditions.
15. U.S.Fish and Wildlife Service. Final Biological Opinion on the Operation of Glen Canyon Dam (January, 1995); National Park Service, Grand Canyon National Park. Endangered, Threatened and Sensitive Wildlife of Potential Occurrence Along the Colorado River in Grand Canyon (Online: <http://data2.itc.nps.gov/nature/documents/ACF18EB.doc>); See also Note 14.
16. Updike, Christopher N., and Steven P. Gloss. "Confronting Social Impediments to Adaptive Management: Lessons From the Grand Canyon Ecosystems." Grand Canyon Monitoring and Research Center: Colorado River Ecosystem Science Symposium (October 2003); See also Note 15, U.S. Fish and Wildlife Service.
16. See Note 14, p. 8.
17. See, e.g., Department of the Interior. Report to Congress: Operations of Glen Canyon Dam Pursuant to the Grand Canyon Protection Act of 1992, Water Years 1999 - 2001, Secretary of the Interior (May, 2002); See Note 15.
18. See Note 15, p. 7, 11.

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19. See Note 15, p. 11.
20. See, e.g., Note 15, p. 4; Clotworthy, Bruce. Parched: The Future of the Glen Canyon Dam in a Drier West. 17 Utah Bar Journal 8; Pub. L. No. 106-113, sec 1000(a)(3) (1999).
21. National Park Service: Public Use Statistics Office. Visitation (Online: <http://www2.nature.nps.gov/stats/>).
22. Aramark Corporation. Powell Resorts and Marinas Announces Seasonal Operating Schedule. Aramark Press Release (October 19, 2004); National Park Service. \$22 Million in Facility Improvement Projects Completed or Ongoing at Glen Canyon National Recreation Area. Glen Canyon NRA Press Release (October 4, 2004).
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24. Latham, Stephen E. Glen Canyon Dam, Arizona: Dam Failure Inundation Study. Bureau of Reclamation, Denver (1998).
25. Bureau of Reclamation. Lower Colorado Region: Water Operations. "Flood Control Operation." Colorado River Interim Surplus Criteria, Final Environmental Impact Statement, 1:17 (2000).
conditions. It fails to adequately address shortages and changing hydrological and climatological conditions, and exacerbates the already severe ecological impacts of the structural system.

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LAKE POWELL & MEAD

Notes: PLEASE DISREGARD EARLIER FAX
AS IT DID NOT ACCOUNT CORRECTLY
THE 142 SUPPORTING NGOs. THIS
FAX IS CORRECT.

**People for the Integrity
of Rivers & Watersheds**

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November 30, 2005

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Via Fax: 702.293.8156; 801.524.3858

Dear Mr. Johnson & Mr. Gold,

Living Rivers, Colorado Riverkeeper, and the 142 undersigned organizations submit the following report, *The One-Dam Solution*, as scoping comments for the development of management strategies for operations at Lake Powell and Lake Mead, on the Colorado River, under low reservoir conditions.

With current demand for Colorado River water nearly at the river's historical annual flow of 13.5 million-acre feet (MAF) and rising, and government-sponsored scientists anticipating average annual flows to decline 18 percent by 2040, the prospect of ongoing low water conditions for Colorado River reservoirs is a near certainty. The average flow of 60 percent into the system for the past six years is firm evidence of this.

For more than 25-years, government scientists and administrators have warned that shortages would be occurring now. This action is the first to reexamine the flawed operational strategies that have been in place as far back as 1922 when the Colorado River Compact allocated 11 percent more water than the Colorado River has to give.

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Reexamining these two reservoirs is critical, as they constitute more than two-thirds of the system's storage capacity, which with declining inflows and increased demand are proving excessive.

Meanwhile, these two reservoirs can cause the loss of upwards of ten percent of the river's average annual flow due to evaporation—valuable water for critical habitats and water users downstream.

Furthermore, the challenges facing the future operations of these reservoirs go beyond water allocation and storage inefficiencies. Sediment entering Lake Powell will eventually compromise Glen Canyon Dam's safety. Despite recent warnings that this could happen sooner than the 40-year-old estimate of 2060, there has been no comprehensive monitoring or analysis conducted to address this inevitable problem.

Lastly, despite more than \$200 million already spent, no gains have been made to restore the critical habitat for endangered species in Grand Canyon National Park impacted by Glen Canyon Dam's operations. The mandates of the Grand Canyon Protection Act and the Endangered Species Act in particular are being ignored to maintain Lake Powell even though it is proving to be both wasteful and unnecessary for water storage.

It is therefore critical that the Bureau of Reclamation broadly reexamine the operations of these facilities in accordance with preparing an Environmental Impact Statement to address the following:

- 1) Pursue transfers of Lake Powell and Lake Mead storage to groundwater aquifers. 1
- 2) Develop a sustainable sediment management program for Lake Powell and Lake Mead. 2
- 3) Determine the costs and benefits of decommissioning Glen Canyon Dam to restore natural flows through Glen and Grand Canyons. 3
- 4) Identify new water allocation guidelines to reflect the amount of water the Colorado River actually provides, how it should be distributed and what amounts are needed to protect critical habitats in Grand Canyon and elsewhere. 4

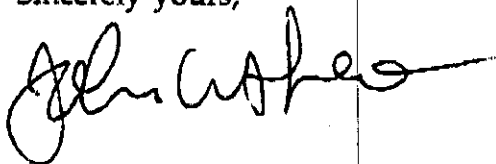
A water management crisis is looming on the Colorado River. The federal government, as Water Master, has the responsibility to help avert this. Most of

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the issues addressed in the attached report are not new, but continuing to ignore them will only worsen the impacts once the crisis arrives.

Thank you for the opportunity to submit these comments. We look forward to assisting the Bureau of Reclamation in developing this Environmental Impact Statement concerning the protection of water resources from the Colorado River in times of shortage.

Sincerely yours,



John Weisheit
Conservation Director, Living Rivers
Colorado Riverkeeper

Attachment: *The One-Dam Solution*
Submitted July 26, 2005 at Henderson, Nevada

On behalf of the following groups:

A Critical Decision
Alabama Environmental Council
Alaska Coalition
American Wildlands
Animas Riverkeeper
Appalachian Forest Coalition
Audubon Society of Greater Denver
Ballona Institute
Black Warrior Riverkeeper
Blackwater/Nottoway Riverkeeper
Bluewater Network
Boulder Regional Group
Buckeye Forest Council
Californians for Western Wilderness
California Save Our Streams Council
Casco Baykeeper
Center for Biological Diversity
Choqueyapu Riverkeeper
Citizens of Lee Environmental Action Network

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Citizens Progressive Alliance
Coalition for Jobs and the Environment
Coastal Law Enforcement Action Network
Cold Mountain, Cold Rivers
Coloradans for Utah Wilderness
Colorado Plateau River Guides
Colorado White Water Association
Columbia Riverkeeper
Conservation Northwest
Coosa River Basin Initiative
Devil's Fork Trail Club
Dogwood Alliance
Earth Action Network
Ecology Center
Electors Concerned about Animas Water
Endangered Habitats League
Erie Canalkeeper
Forest Guardians
Forest Watch
Forests Forever
Foundation for Global Sustainability
Four Corners School of Outdoor Education
Free the Planet
Friends of Living Oregon Waters
Friends of the Animas River
Friends of Blackwater Canyon
Friends of the Earth
Friends of the Eel River
Friends of the Estuary at Morro Bay
Friends of Hurricane Creek
Friends of the Milwaukee River
Friends of the Nanticoke River
Friends of Yosemite Valley
Gifford Pinchot Task Force
Glen Canyon Institute
Goods From The Woods
Grand Canyon Private Boaters Association
Grand Riverkeeper
Great Egg Harbor Watershed Association
Great Old Broads for Wilderness
Greenaction for Health and Environmental Justice
Green Delaware

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Green Party of Utah
Green Party of York County
Hells Canyon Preservation Council
Hudson Riverkeeper
Hurricane Creekkeeper
Indiana Forest Alliance
Inland Empire Waterkeeper
International Rivers Network
International Society for Preservations of the Tropical Rainforest
Johnson County Green Party
Jumping Frog Research Institute
Kern Valley River Council
Kettle Range Conservation Group
Land Institute
London Canalkeeper
Lone Tree Council
Los Alamos Study Group
Louisiana Bayoukeeper
Lower Neuse Riverkeeper
Maricopa Audubon
Milwaukee Riverkeeper
Montana River Action
Morava Riverkeeper
National Organization for Rivers
National Water Center
New Riverkeeper
New River Foundation
Northwest Rafters Association
Northwoods Wilderness Recovery
Neuse River Foundation
Ogeechee-Canoochee Riverkeeper
Orange County Coastkeeper
Oregon Natural Desert Association
Outdoor Adventure River Specialists
Outward Bound West
Patapsco Coastkeeper
Patrick Environmental Awareness Group
Puerto Rico Coastkeeper
Raritan Riverkeeper
Red Rock Forests
Restore: The North Woods
Ridgeline & Open Space Coalition

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River Runners for Wilderness
Riverhawks
Rocky Mountain Peace and Justice Center
Russian Riverkeeper
Sacramento River Preservation Trust
Salt Creek Watershed Network
San Diego Coastkeeper
San Luis Obispo Coastkeeper
Santa Monica Baykeeper
Satilla Riverkeeper
Save the Illinois River
Siskiyou Project
Snake River Alliance
South Riverkeeper
South Yuba River Citizens League
Southern Appalachian Forest Coalition
Southern Utah Wilderness Alliance
Spirit of Sage Council
Swan View Coalition
Taking Responsibility for the Earth and Environment
Taxpayers for the Animas River
The Clinch Coalition
The River Project
Umpqua Watersheds
Upper Coosa Riverkeeper
Upper Neuse Riverkeeper
Ventura Coastkeeper
Virginia Forest Watch
Waterkeepers of Australia
West/Rhode Riverkeeper
Western Lake Erie Waterkeeper
Western Lands Project
Western Watersheds Project
Wetlands Action Netork
Wild South
Wild Virginia
Wild Wilderness
Wilderness Watch
Wildlaw

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National Wildlife Federation ∞ Pacific Institute ∞ Sierra Club
Sonoran Institute ∞ The Nature Conservancy

November 30, 2005

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Via Mail and Facsimile (801) 524-3858

Re: Colorado River Reservoir Operations: Development of Lower Basin Shortage
Guidelines and Coordinated Management Strategies for Lake Powell and Lake
Mead Under Low Reservoir Conditions

Dear Sirs:

These scoping comments regarding Lower Basin shortage guidelines and coordinated management strategies for Lake Powell and Lake Mead are submitted on behalf of Defenders of Wildlife, Environmental Defense, National Wildlife Federation, Pacific Institute, Sierra Club, Sonoran Institute and The Nature Conservancy. We are glad to see that the Bureau of Reclamation (Reclamation) will be preparing an Environmental Impact Statement (EIS) on Lower Basin shortage guidelines and coordinated management strategies. An EIS will provide Reclamation and the public with analyses of the costs, benefits, and environmental implications of alternative guidelines and strategies. We urge Reclamation to consider a broad range of alternatives for introducing increased flexibility into river management, including that described below in the Conservation Before Shortage proposal (attached). Reclamation may also pursue additional actions to increase operational flexibility, maximize the beneficial use of water within the U.S., or delay the onset of shortage, such as the proposed Drop 2 Reservoir Project.¹ These

¹ In addition to options already put forward, such as conjunctive reservoir management and water banking in Lake Mead, there are also less complicated measures available to Reclamation. For example, timely issuance of the Decree Accounting Report would ensure timely payback of inadvertent overruns and a smaller burden on system storage.

actions are also within the scope of Reclamation's EIS as they may inform the alternatives or they may be interrelated actions with environmental impacts.

While Reclamation is still developing alternatives for National Environmental Policy Act (NEPA) analysis, we note that the Federal Register notice states that any shortage guidelines are likely to be interim in nature. We urge Reclamation to follow the spirit of NEPA and consider a range of mechanisms as well as content in the EIS. Unlike the Interim Surplus Guidelines, shortage guidelines will be designed to satisfy a long-standing need – management during low reservoir conditions. Shortage guidelines should be designed to guide water management and use now and in the future, as the drought conditions that have prevailed in the Colorado River Basin for the past six years may continue, are certain to return in the future, and could well be more frequent than they have been in the last century. Mechanisms to increase flexibility in the river system and allocate potential shortfalls will thus need to be applicable for the long-term, particularly as the Upper Basin continues to develop its water supply and as water availability in the entire Basin is impacted by extended drought events or by climate change. While changes to shortage management strategies may well be necessary in the future to respond to changing demands associated with human and environmental needs in the Lower Basin, Upper Basin, and Mexico, it is critical that Reclamation establish a lasting framework within which long-term water planning can be conducted.

We understand that representatives of the Colorado River basin states are reluctant to support a permanent shortage policy. To address their concerns, we suggest that Reclamation incorporate a mechanism for the periodic review of the shortage guidelines, perhaps in conjunction with the five-year review of the Long-Range Operating Criteria, to provide an “off-ramp” if the shortage guidelines need to be revised or terminated. Such a review would afford a clear mechanism for changing the guidelines, if necessary, without forcing upon Reclamation the unreasonable burden of re-initiating the time-consuming process of developing new shortage guidelines. Long-term shortage guidelines will permit water users long-term certainty and predictability.

Conservation Before Shortage

The groups on this letter have already submitted a proposal for consideration as an alternative, entitled “Conservation Before Shortage,” as to the substance of a management strategy during shortage. The intent of the Conservation Before Shortage proposal is to suggest a method by which increased flexibility can be introduced into the management of river resources in order to increase the reliability and predictability of water deliveries under low reservoir conditions. Providing for increased levels of flexibility in river management will be critical to meeting the demands of both human and environmental water users in the future, particularly as Upper Basin use and the impacts of climate change decrease overall water availability in the Colorado River system.

The Conservation Before Shortage proposal would dramatically reduce the risk of large-scale, involuntary shortages to Lower Basin users and to Mexico, by implementing a series of increasing conservation targets linked to the declining elevation of Lake Mead. The required amount of water would be conserved by offering to pay Colorado River water users, located

anywhere in the Lower Colorado River basin or in Mexico, to voluntarily and temporarily forbear water use. Funds to pay for conservation could come from federal appropriations as well as from a surcharge applied to all Lower Basin water users and consumers of power generated at the Hoover Dam.

Conservation Before Shortage offers many benefits, such as increasing predictability for water users, protecting the environment, improving power production, and reducing the need for new water projects. The Conservation Before Shortage is a proactive approach that protects Colorado River water users and the environment from abrupt reductions in the amount of water available. Conservation Before Shortage will significantly reduce the likelihood of involuntary and uncompensated shortages in the Lower Basin at levels above 500,000 acre-feet (the approximate level at which a shortage exceeds the ability of the Arizona Water Bank to readily buffer the shortage).

In addition, fish, wildlife, and natural areas on the Colorado River do not, for the most part, have their own water rights. As such, they are “last in line” for water, and are the most vulnerable of all water users to drought. Conservation Before Shortage reduces overall water consumption in dry years, decreasing the risk of shortages that could disproportionately impact environmental uses in the future. Also, by increasing protection against shortage for water users that have inflexible demands, it will allow some water to remain in the river for the wildlife that needs it to survive while still meeting critical human needs.

Third, consistent maintenance of reservoir storage and power head above baseline conditions in average to low flow conditions will eliminate the risk that elevations at Lake Mead will drop below minimum power head, improving the reliability of power production. Lastly, the introduction of flexibility into Colorado River management will allow those who are willing and able to reduce their water use to be compensated for doing so, and avoid the need to impose reductions in water use on those who cannot. By eliminating the potential for water shortages where they cannot easily be accommodated, this policy will limit the need for costly new water projects to protect water users.

Mexico and Shortage

Article 10 of the 1944 Treaty with Mexico grants the International Boundary and Water Commission/ Comisión Internacional de Límites y Aguas (IBWC/CILA) the discretion to determine surplus and shortage flows to Mexico. It is therefore beyond the scope of the current process to set shortage criteria for Mexico.

If, however, in the development of shortage guidelines and management strategies, Reclamation moves beyond defining a shortage on the Lower Colorado River as referred to in *Arizona v. California*² and either defines drought (whether explicitly or implicitly) as referred to in the 1944 Water Treaty or affects the U.S. delivery obligation to Mexico, we urge Reclamation to initiate discussion and negotiation with and among the International Boundary and Water Commission, the Comisión Internacional de Límites y Aguas, and other appropriate entities in the U.S. and Mexico as soon as possible. Prompt inclusion of these parties will help ensure

² 376 U.S. 340 (1964).

meaningful participation in the guidelines and strategies and proper consideration of their environmental impacts in the EIS.

In closing, thank you for this opportunity to offer the Conservation Before Shortage proposal and additional comments. Conservation Before Shortage would create a predictable, rational system for water users and distribute the costs between water and power users and the federal government. We are continuing to revise and refine the Conservation Before Shortage alternative. As Reclamation develops alternatives and a draft EIS, we intend to submit our revised proposal and supporting materials based on additional modeling and new information in any proposals from the basin states and others. Please contact us if you have any questions.

Sincerely,

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Conservation Before Shortage

Proposed Shortage Criteria for Colorado River Operations

I. Background/Context

The effects of a multi-year drought have had a tremendous impact on storage in the Colorado River basin. Although above-average precipitation in the Lower Basin has led to small recoveries in system storage over the winter of 2004-2005, total system storage on the Colorado River has decreased by more than 40% over the past several years. As a result, there is a real possibility that the Secretary of the Interior will declare an actual shortage on the lower Colorado River in the near future. A shortage declaration would reduce deliveries to the Central Arizona Project (CAP) and to southern Nevada (which are among the first in line for cuts in the event of a shortage).

The surface elevation of Lake Mead dropped more than 80 feet from the end of 2000 through the end of 2004; Lake Powell dropped by more than 115 feet in this period. The Bureau of Reclamation's (Reclamation's) Riverware model of the Colorado, based on historic flow records, projects that reservoir levels at Lake Powell could head quickly towards the minimum power pool if the drought continues, and reservoir levels at Lake Mead could fall below the elevation of southern Nevada's upper intakes or remain in a long-term decline that will be difficult to reverse until Powell begins to re-fill. In addition, the model predicts that even if precipitation levels returned to average today, it could take 10-20 years for the Colorado River reservoir system to recover fully (during which time continued development of water supplies in the Upper Basin will further shrink available supplies). As a result, it is time to begin a long-delayed discussion about the method for defining, mitigating, and sharing shortages on the Colorado River.

Although the Secretary of the Department of the Interior (Secretary) has the authority to declare a shortage on the Colorado River, thereby reducing deliveries to some Lower Colorado River contractors, to date no criteria exist for determining when such a shortage will be declared. In June 2005, the Department of the Interior (DOI) noticed its intent to begin a public scoping process for the development of "Lower Basin Shortage Guidelines," (70 Fed.Reg. 34794). In 2004, DOI initiated a series of technical meetings with the Colorado Basin states to discuss drought issues, and the seven Basin states met frequently among themselves throughout the winter of 2004-2005 to discuss potential shortage criteria. Non-governmental organizations (NGOs) were not invited to participate in these discussions; however, several NGOs with interest and expertise in Colorado River issues began meeting over the winter to develop an alternative shortage proposal. These organizations met with Reclamation staff to review the results of technical modeling runs developed in support of the states' discussions, and Reclamation has provided additional modeling data to these interested NGOs in response to their inquiries and to evaluate potential shortage criteria.

These meetings led to the development of this document, which proposes an approach to the management of shortages in the Lower Colorado through the implementation of a tiered conservation program that is tied to the surface elevation of Lake Mead.

II. Rationale for this Proposal

The basic rationale behind this "Conservation Before Shortage" proposal is that shortage criteria should attempt to maximize the reliability and predictability of water deliveries on the Lower Colorado by introducing increased flexibility into the management of river resources when shortage conditions are imminent.

Principles:

- It is desirable to protect the elevation of Lake Mead at 1050 feet (the current minimum power pool) to the extent feasible without implementing shortages that would involuntarily curtail deliveries to Lower Basin users.
- It is desirable to protect the elevation of Lake Mead at no less than 1000 feet under any condition in order to protect Southern Nevada Water Authority's lower intake structures, as well as the new minimum power pool if proposed low-pressure turbines are installed at Hoover Dam.
- It is desirable to avoid shortages in the Lower Basin above 500,000 acre-feet whenever possible (the approximate level at which shortages would cut into CAP's deliveries beyond those currently utilized for water banking).
- It is preferable for Lower Basin water users to voluntarily engage in predictable, small-scale reductions in use – and receive compensation for those reductions – rather than face large-scale, involuntary, and uncompensated disruptions in water deliveries that could cut into municipal and agricultural water supplies and create unmitigated economic impacts.
- Minimizing large, forced disruptions to normal deliveries as a result of shortage declarations will minimize the threat of unmitigated environmental impacts in the Lower Colorado River and Delta as a result of significantly decreased deliveries to low-priority users and corresponding return flows that support environmental values.
- Market-based programs, with low transaction costs and appropriate mitigation of third-party impacts, can offer a reasonable mechanism for minimizing the risk and impacts of shortage.¹
- Users of Colorado River water in Mexico may wish to participate in short-term conservation agreements, to reduce the probability of larger, uncompensated future reductions due to a declaration of shortage under the 1944 Treaty with Mexico.
- Water can be obtained from agricultural users in the United States, and could be obtained in Mexico with an appropriate agreement,² through the use of voluntary, market-based forbearance programs. Economic studies of Lower Basin agricultural use, as well as recent leases of water from farmers in this area, suggest that there is a large volume of water in the basin that could be obtained for \$20 - 100 per acre-foot (see Figure 9).

¹ Some 4.5 million acre-feet of Colorado River water are used to irrigate crops in the Lower Basin states, and more than 1 million acre-feet are used to irrigate crops in Mexico. Conservation of between 200,000 and 600,000 acre-feet through the use of part-year fallowing programs, dry year options, or other similar arrangements would constitute only 4-11% of total Lower Basin agricultural use in the United States and Mexico. (However, as even small-scale reductions in agricultural water use may have third-party impacts, some portion of funds accrued for the purchase of water should be set aside to support community economic development in affected areas.) Conversely, without these small-scale reductions, water users would likely be faced with the need to curtail large amounts of water quite abruptly, with significant economic consequences. (Shortages of nearly 2 million acre-feet in a single year are predicted by Reclamation's model when the 1000 feet elevation is protected at Lake Mead without conservation measures).

² Such an agreement would likely require a new Minute to the 1944 Treaty with Mexico. Fallowing agreements in Mexico would have to be administered by the appropriate authorities.

III. Conservation Before Shortage Policy

The "Conservation Before Shortage" policy essentially consists of two sets of criteria tied to projected elevations at Lake Mead on January 1 of a given year, according to the Bureau of Reclamation's August 24-month study. These criteria consist of three "conservation triggers," which impose progressively increasing conservation goals as lake levels drop from 1100 feet to 1050 feet, and a "shortage trigger," which imposes involuntary shortages in the Lower Basin as are necessary to accomplish absolute protection of Lake Mead at a minimum elevation of 1000 feet.

(A) Normal Conditions

In years when the 24-month study projects the elevation of Lake Mead on January 1 will be at or above 1100 feet, the Secretary of the Interior (Secretary) shall determine a Normal or Surplus (as defined by the Interim Surplus Guidelines) year.

(B) Conservation Triggers

First Conservation Trigger: Below 1100 Feet at Lake Mead

In years when the 24-month study projects the elevation of Lake Mead on January 1 will be at or above 1075 feet but below 1100 feet, the Secretary will seek to conserve 200,000 acre-feet of water. On behalf of the Secretary, Reclamation will preferentially seek to achieve this 200,000 acre-feet of savings by means of voluntary conservation agreements (including forbearance agreements) with Lower Basin delivery-contract holders. Additionally, Reclamation will, to the extent permitted by law and through the appropriate authorities, seek forbearance or other such water conservation agreements with Colorado River users in Mexico. In the case of such agreements, U.S. deliveries of Colorado River water to Mexico at the Northerly International Boundary will be reduced by the total volume indicated by these binational agreements.

Second Conservation Trigger: Below 1075 Feet at Lake Mead

In years when the 24-month study projects that the elevation of Lake Mead on January 1 will be at or above 1050 feet but below 1075 feet, the Secretary will seek to conserve 400,000 acre-feet of water. Reclamation will preferentially seek to achieve this 400,000 acre-feet of savings by means of voluntary conservation agreements (including forbearance agreements) with Lower Basin delivery-contract holders. Additionally, Reclamation will, to the extent permitted by law and through the appropriate authorities, seek forbearance or other such water conservation agreements with Colorado River users in Mexico. In the case of such agreements, U.S. deliveries of Colorado River water to Mexico at the Northerly International Boundary will be reduced by the total volume indicated by these binational agreements.

Third Conservation Trigger: Below 1050 Feet at Lake Mead

In years when the 24-month study projects that the elevation of Lake Mead on January 1 will be below 1050 feet (minimum power pool absent the installation of low-pressure turbines), the Secretary will seek to conserve 600,000 acre-feet of water. Reclamation will preferentially seek to achieve this 600,000 acre-feet of savings by means of voluntary conservation agreements (including forbearance agreements) with Lower Basin delivery-contract holders. Additionally, Reclamation will, to the extent permitted by law and through the appropriate authorities, seek

forbearance or other such water conservation agreements with Colorado River users in Mexico. In the case of such agreements, U.S. deliveries of Colorado River water to Mexico at the Northernly International Boundary will be reduced by the total volume indicated by these binational agreements.

(C) Shortage Trigger

Absolute Protection of Lake Mead Elevation 1000 Feet

The Secretary shall not permit the elevation of Lake Mead to drop below elevation 1000 feet (minimum low-pressure power pool and Southern Nevada Water Authority intakes) at any time. Shortages to Colorado River contractors shall be implemented in the Lower Basin and in Mexico³ to the extent necessary to prevent such declines.

(D) Funding Mechanisms

In recognition of the federal government's continuing national obligation to replace the MODE bypass flow to Mexico, 43 U.S.C. § 1571(c), the federal government will assume responsibility for the cost of all conservation agreements up to the volume of the bypass flow that the Secretary has not otherwise replaced in the year that a conservation trigger becomes effective. Given the national interest in minimizing both environmental impacts and economic disruptions resulting from the involuntary curtailment of deliveries to Colorado River users, the federal government would also assume responsibility for half of the cost of any additional agreements required to generate conserved water for the "Conservation Before Shortage" policy, pursuant to the Secretary's authority under the Reclamation States Emergency Drought Relief Act of 1991 (Drought Relief Act),⁴ conservation authorities in the Farm Bill, or other appropriate authority that may be granted by Congress.

To the extent that conservation of water is required beyond that to be funded by the federal government in the manner described above, conservation activities would be funded through one or both of the following:

Power Pool Protection Fund

The priority of water used for power generation is considered to be tertiary to that of irrigation and domestic use under the Law of the River. As a result, Hoover and Glen Canyon Dams are operated to maintain deliveries to water users regardless of the impact of declining reservoir levels on power production. However, one of the more significant corollary benefits of the conservation program described in this proposal, beyond the primary benefit of protecting water users from involuntary and uncompensated shortages, would be the preservation of power production at Hoover Dam at higher levels and for longer durations by reducing deliveries for irrigation, domestic use, and underground storage in a manner that would not otherwise occur under current practices.

³ In the event that a shortage is declared and is also considered to be an extraordinary drought under the 1944 Treaty, deliveries to Mexico will be reduced in the same proportion as consumptive uses in the United States are reduced.

⁴ The Reclamation States Emergency Drought Relief Act of 1991, 43 U.S.C. §§ 2201 *et seq.*, provides the Secretary of Interior the authority to purchase water "from willing sellers, including, but not limited to, water made available by Federal Reclamation project contractors through conservation or other means with respect to which the seller has reduced the consumption of water." 43 U.S.C. § 2211(c).

Given the significant loss in generating capacity that has already occurred as a result of declines in power pool elevations,⁵ and the even more significant impacts that would be associated with a total loss of generating capacity, the implementation of "Conservation Before Shortage" would clearly benefit power purchasers and consumers. As such, it would seem reasonable to derive a percentage of the funding for the proposed voluntary conservation program from a modest, conditional surcharge on power rates under existing or renewed contracts for hydropower produced at Hoover Dam as a means to mitigate against the loss of power head and stave off the complete loss of power production at Hoover Dam.⁶ This surcharge could be imposed in years when Reclamation's August 24-month study projects that the storage in Lake Mead falls below fifty percent of its active capacity. The revenues generated by this surcharge could be collected in a "power pool protection fund," to be maintained by Reclamation for expenditure when and if lake elevations reach a conservation "trigger."

Temporary Cost Recovery/Delivery Surcharges

Pursuant to the Drought Relief Act, the Secretary of Interior is authorized to engage in water purchases from willing sellers and to seek cost recovery for water delivered from the users of that water under temporary contracts. 43 U.S.C. §2211(c), §2212(a),(c). Reclamation could utilize this authority to purchase water through temporary, part-year fallowing arrangements, dry-year options, or similar mechanisms, and would seek cost recovery from Colorado River users. In recognition of the Basin-wide interest in alleviating the impacts of drought and reducing uncertainty on the Lower Colorado, and in the interests of encouraging extraordinary conservation to minimize the likelihood of significant delivery interruptions, the cost of some portion of conservation agreements, including those with Colorado River users in Mexico, could be funded through a conservation surcharge imposed on a per-acre-foot basis on all Lower Basin contractors.

Anticipated Cost of Conservation

Current short-term leasing agreements between farmers and irrigation districts or municipal water agencies, as well as recent research on the net returns per acre-foot of irrigation water, suggest that "Conservation Before Shortage" water could be obtained for \$20 - 100 per acre-foot. To ensure that such water remains available in times of increased scarcity (when market forces might otherwise increase the cost), the Secretary should be granted the authority to enter into "Conservation Before Shortage option agreements," similar to existing dry-year leasing agreements/interruptible supply agreements that have been enacted within the basin states.

⁵ Largely as a result of declining reservoir elevations, power production at Hoover and Glen Canyon has declined steadily since the onset of drought conditions in the Colorado River Basin. Annual power production at Hoover fell from 5,697 gigawatt-hours (GWh) in 1998 to 4,094 GWh in 2003, according to Western Area Power Administration (WAPA) Annual Reports, 1998 - 2003. A portion of hydropower revenues currently supports the two Upper Basin endangered fish recovery programs, the Glen Canyon Adaptive Management Program, and the Colorado River Salinity Control Program; alternative sources of revenue should be identified and implemented to fully fund these recovery programs. The Department of the Interior should also work proactively with WAPA to identify alternative sources of power for those Indian tribes that have experienced power shortages, or drastic increases in power costs, due to the declining production associated with falling reservoir levels.

⁶ The rates for power produced at Hoover Dam have increased as reservoir levels and power production have declined, but may still remain well below open market rates. Although annual revenues tend to vary from year to year, revenues from Hoover Dam power production have generally been in the range of \$50 million annually.

IV. Analysis: Benefits of Conservation Before Shortage Policy

To date, actual shortage criteria for the Colorado River have not been defined. For the purposes of comparison, a 'baseline' was defined as the current operating conditions for the Colorado River, with the addition of a policy requiring the absolute protection of Lake Mead at 1000 feet (that is, Hoover Dam would not release any water to cause the elevation of Lake Mead to drop below 1000 feet). The baseline policy does *not* provide for the implementation of conservation measures. These 'baseline' conditions, reflecting current operating conditions, are depicted in the following figures.

Analysis of the "Conservation Before Shortage" policy suggests that this policy could produce significant benefits for Basin water users by:

- Consistently maintaining reservoir storage and power head above baseline conditions in average to low flow conditions, resulting in increased power production and improved power revenues;
- Significantly reducing the likelihood of involuntary, uncompensated shortages in the Lower Basin and corresponding, unmitigated economic impacts;
- Significantly reducing the likelihood of involuntary and uncompensated shortages in the Lower Basin at levels above 500,000 acre-feet (the approximate level at which a shortage imposed by the Secretary would cut into CAP deliveries, by exceeding the ability of the Arizona Water Bank to readily buffer the shortage); and
- Eliminating the risk that elevations at Lake Mead will drop below minimum power head, improving the reliability of power production and associated revenues.

The analyses below show the impacts of the "Conservation Before Shortage" (CBS) policy on reservoir operations based on historic flows in the Colorado River Basin.

Modeling Assumptions

The proposed "Conservation Before Shortage" policy was modeled using Reclamation's Riverware model, which is based on historical records of flows in the Colorado River Basin over approximately the past century. Conservation triggers, as described in Section III, were implemented at 1100 feet, 1075 feet and 1050 feet, with the assumption that required measures to reduce Lower Basin consumptive use by 200,000, 400,000, and 600,000 acre-feet, respectively, would be implemented in years when the January 1 elevation at Lake Mead is below the triggers. An absolute protection trigger was implemented at Lake Mead elevation 1000 feet, with releases from Lake Mead to meet delivery obligations to Lower Basin users reduced as necessary to maintain that level. To avoid even modestly under-predicting the elevations of Mead and Powell pools, particularly in the near term, this modeling has assumed that the schedule of Upper Basin depletions will effectively begin with the last reported actual level for CY 2000, will increase at a

slower rate than projected by the Upper Colorado River Basin Commission through CY 2009, and will increase at the rate projected by the Commission thereafter.⁷

For purposes of the model, the minimum objective release out of Lake Powell was assumed to be 8.23 maf per year (reflecting current operating conditions).⁸ Alternative scenarios for conjunctive management were not modeled, and the protection of a minimum power pool at Lake Powell was not incorporated into this proposal; either or both of these assumptions would affect the elevation of Lake Powell. Model runs used end-of-year 2004 elevations at Lake Mead and Lake Powell to establish initial conditions for 2005, and were run through year 2025.

Protection of Lake Mead

Figures 1 -3 show the potential value of implementing the CBS policy, under a range of average to extremely low flow conditions. **These and following figures show that the CBS policy would greatly benefit the elevation of Lake Mead.**

As shown in Figure 1 below, under average conditions, the CBS policy would maintain reservoir elevations at Mead approximately 30 feet above the baseline policy. As shown by Figures 2 and 3, the CBS policy would significantly reduce the rate of decline in the lower 25th and in the very low 10th percentile reservoir elevations for Mead and maintain even these lower reservoir elevations above the 1000 foot protection level. Model runs showed essentially no impact of the CBS on the higher 90th percentile Mead elevations, so no figure is provided.

⁷ See "Estimates of Future Depletions in the Upper Division States," Upper Colorado River Commission Memorandum, December 23, 1999. This schedule predicts a 440,000 acre-foot increase in Upper Basin depletions between 2000 and 2010 and a 542,000 acre-foot increase over actual CY2000 depletions, as reported in Reclamation's Consumptive Uses and Losses 1996-2000 report (see Tables UC-1 & UC-6). Actual increases in Upper Basin depletions water may not keep pace with this schedule, because water that would otherwise have been utilized has been and may continue to be physically unavailable for depletion in the Upper Basin due to drought conditions, and in other cases, projects that were proposed to have been constructed during this period may not yet have been or will not be completed through CY 2009. A slower rate of increase from 2000 to 2009 was modeled by subtracting four increments of 100,000 acre-feet from the Commission's schedule from CY 2005 to 2009. This and all other Riverware modeling exercises should be revised to reflect actual increases in Upper Basin depletions as soon as more current information becomes available.

⁸ This assumption is not intended to endorse or reject the Secretary's current use of 8.23 maf as the minimum release objective for Powell, the protection of a minimum power pool at Powell, or proposals for the conjunctive management of the combined storage of Mead and Powell. Alternative release scenarios should be incorporated into the modeling for this proposal as they are developed. As a general matter, none of the assumptions used in this proposal should be construed as an interpretation of the 1922 Colorado River Compact, the 1944 Treaty with Mexico, or any other aspect of the Law of the River.

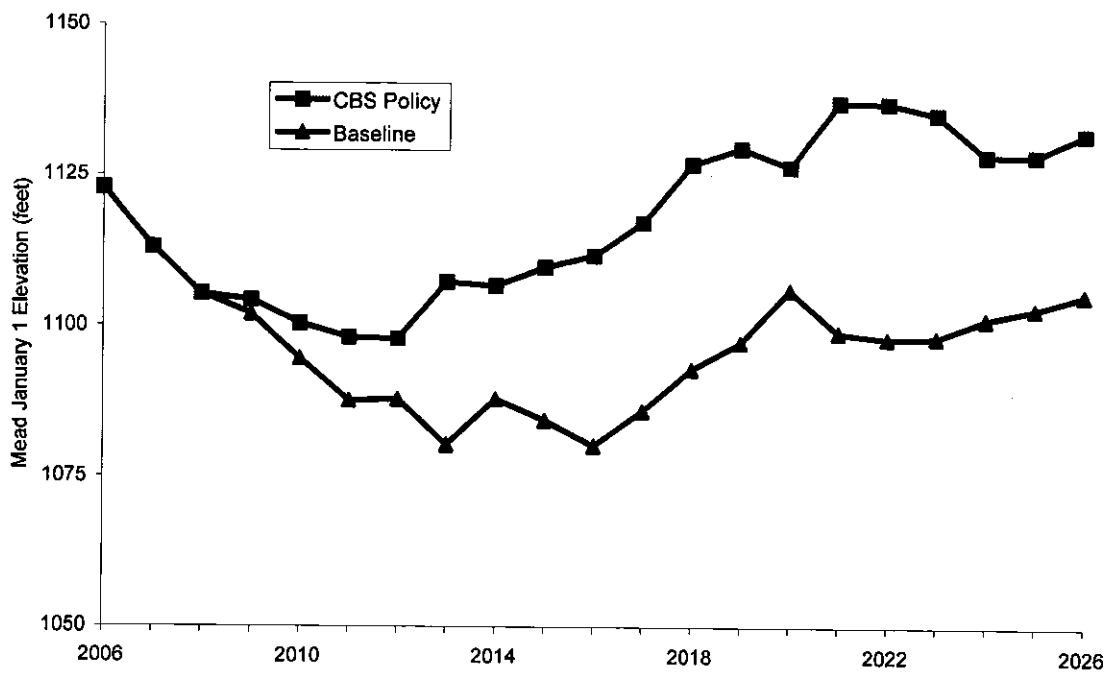


Figure 1. Impact of CBS policy on elevations at Lake Mead, at 50th percentile elevation.

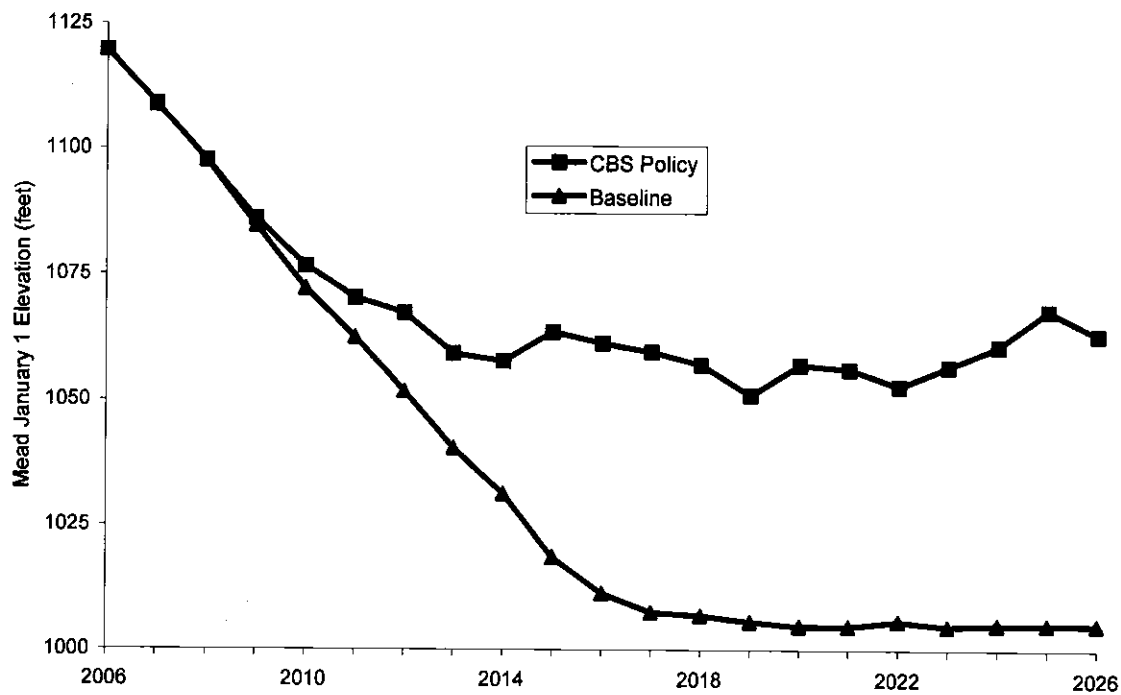


Figure 2. Impact of CBS policy on elevations at Lake Mead, at 25th percentile elevation.

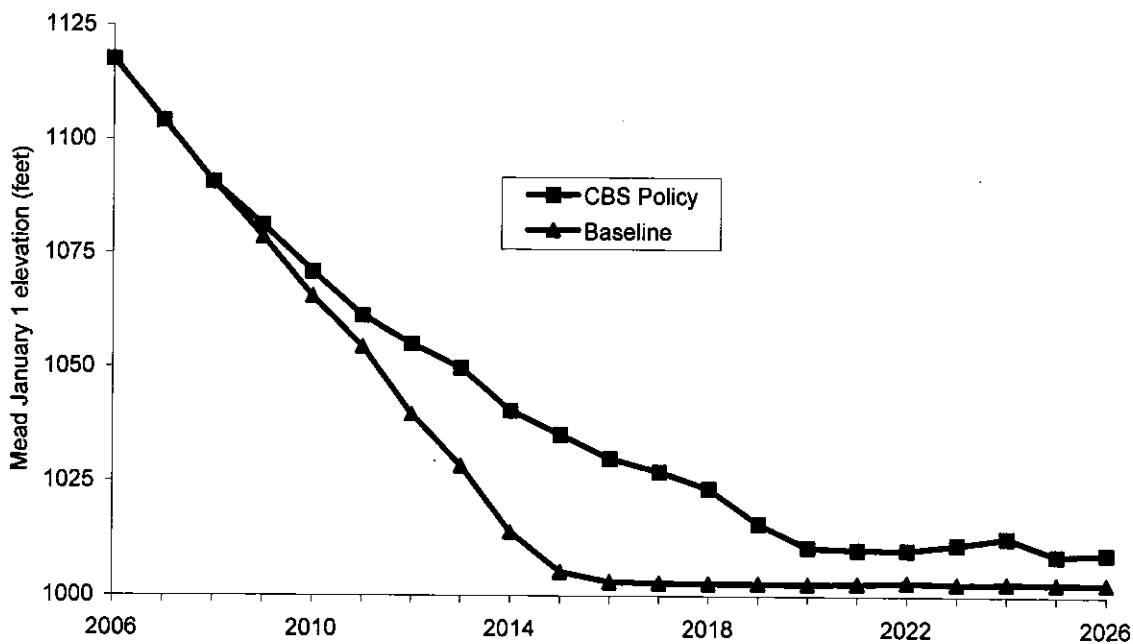


Figure 3. Impact of CBS policy on Lake Mead elevation, at 10th percentile elevation.

Probability of Shortages

As noted above, a primary goal of the CBS policy is to significantly reduce the probability of an involuntary, uncompensated shortage in excess of 500,000 acre-feet (the approximate level at which CAP deliveries would be reduced beyond that currently utilized for water banking). As shown in Figure 4, below, the probability of shortages exceeding 500,000 acre-feet is reduced to 5% or less through the entire modeled period under the CBS policy. By contrast, the probability of shortage under the baseline policy rapidly approaches 30% during this same period. Furthermore, as shown in Figure 5, below, the CBS policy reduces the probability of any involuntary shortage by approximately 20% over the next 20 years.

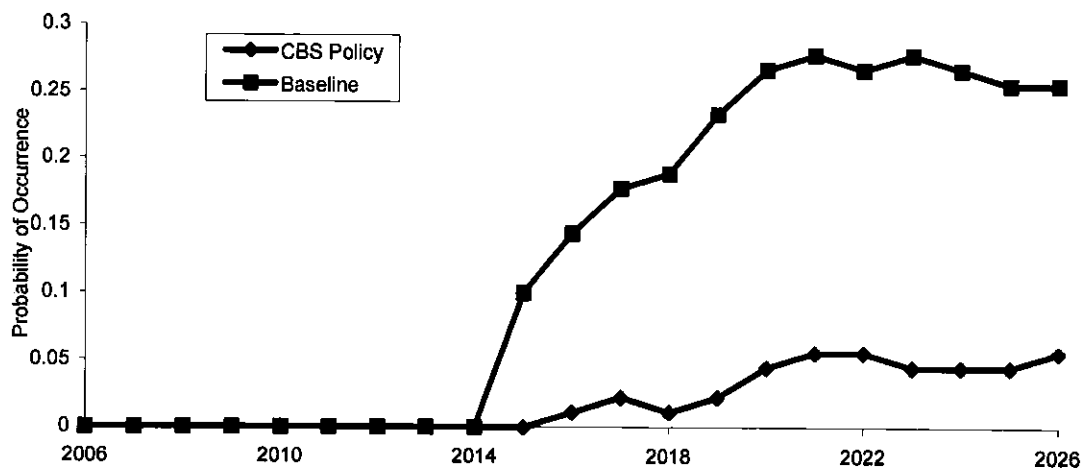


Figure 4. Impact of CBS policy on probability of involuntary Lower Basin shortage greater than 500,000 acre-feet.

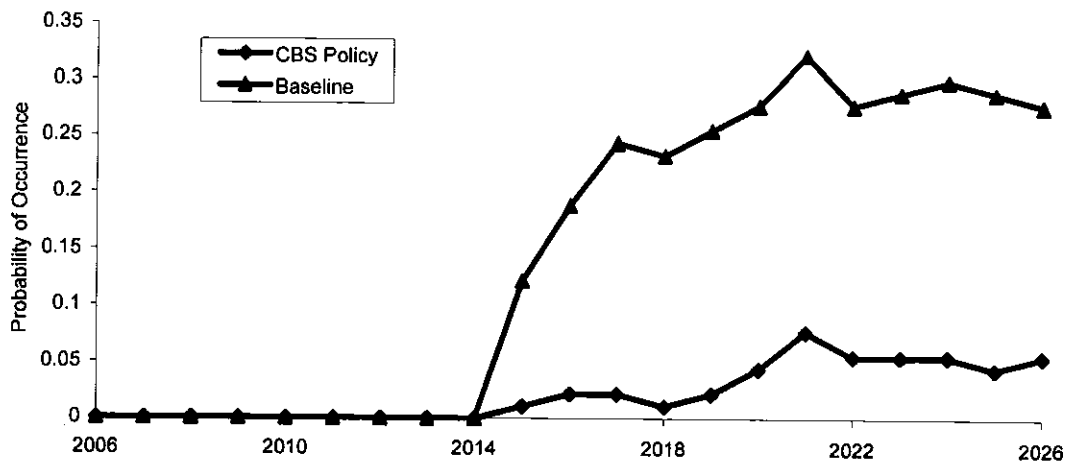


Figure 5. Impact of CBS policy on probability of any involuntary shortage in the Lower Basin.

Probability of Reaching Conservation Triggers

Figures 6 - 8, below, show the relative probability of reaching or exceeding any of the proposed conservation triggers at 1100 feet, 1075 feet and 1050 feet. As one might expect, the probability of reaching the first two triggers is highest in the earlier years of the modeled period, while the probability of reaching the third trigger is higher towards the end of the modeled period. However, the probability of reaching and continuing to remain below a given trigger for an extended period of time appears to be low because of the conservation measures tied to the triggers. For obvious reasons, trigger levels are most likely to be reached under low or very low flow conditions, and are rarely (if ever) reached under high flow conditions.

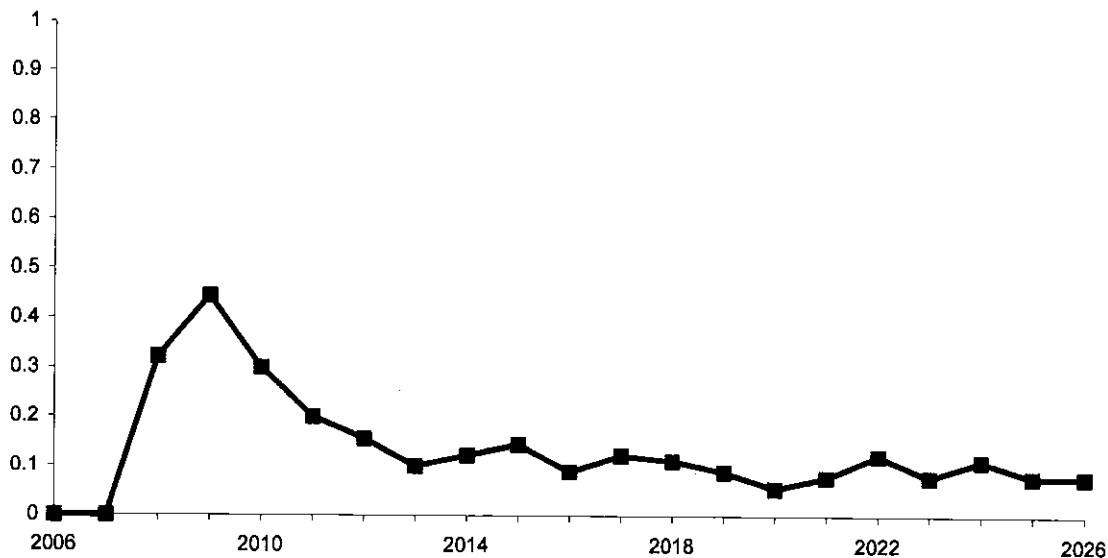


Figure 6. Probability of Lake Mead January 1 elevation occurring in a bounded range of 1100 feet to 1075 feet, with CBS policy in place.

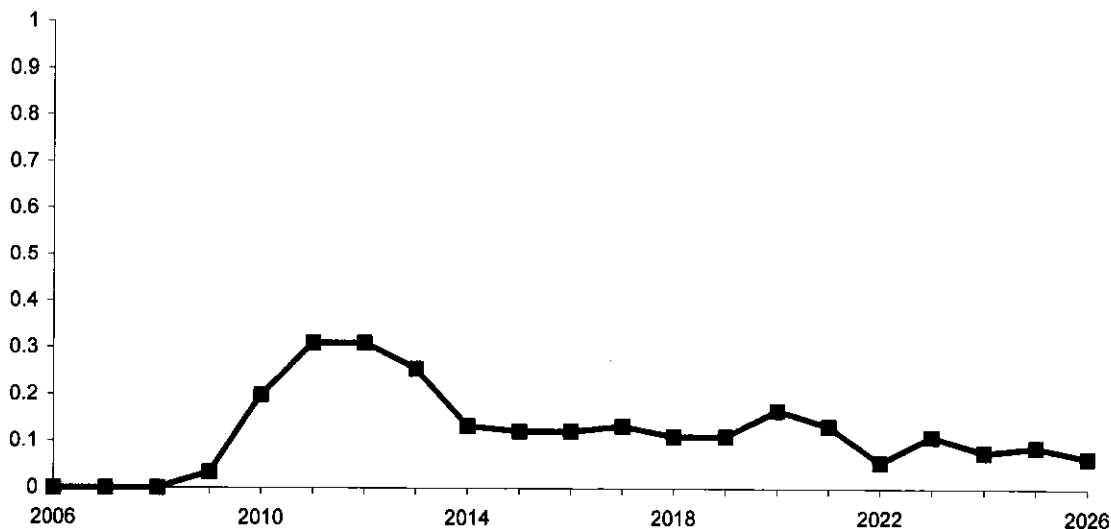


Figure 7. Probability of Lake Mead January 1 elevation occurring in a bounded range of 1075 feet to 1050 feet, with CBS policy in place.

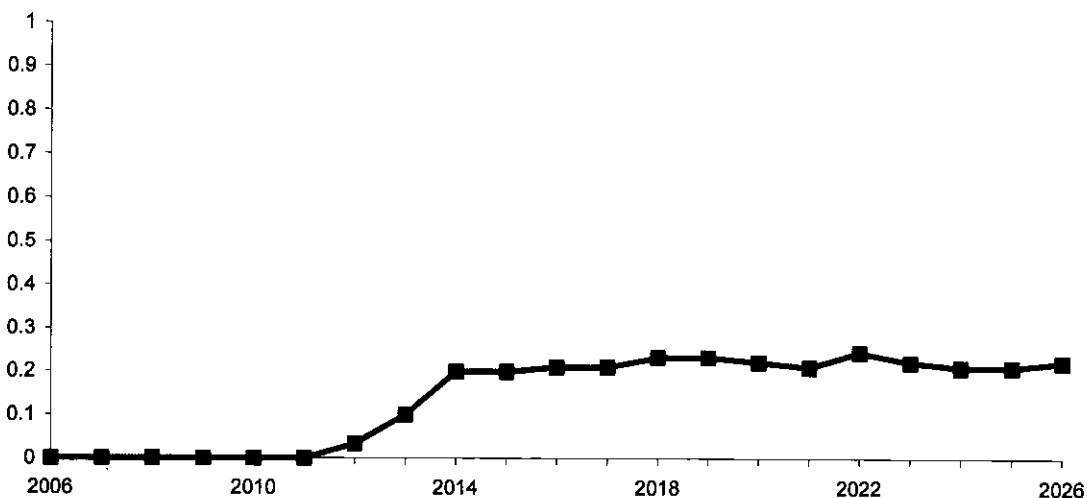


Figure 8. Probability of Lake Mead January 1 elevation occurring below 1050 feet, with CBS policy in place.

Cost of Implementing Conservation Triggers

The cost of implementing conservation triggers is directly related to the cost of obtaining water using the proposed voluntary, market-based conservation mechanisms. Recent purchases of water from farmers in the Lower Basin, as well as analysis of agricultural production in this area, suggest that there is a substantial volume of water used for irrigation which could potentially be obtained on a temporary basis for \$20 - 100 per acre-foot. For example, in 2004, the Imperial Irrigation District acquired water from its farmers for less than \$60 per acre-foot.

As shown in Figure 9, a recent economic study by Environmental Defense into the profits returned by field crops suggests that slightly more than 2.3 million acre-feet of agricultural water

is being used by Lower Basin farmers in California and Arizona to produce profits of less than \$100 per acre-foot; more than one million acre-feet of agricultural water is being used to produce profits of less than \$20 per acre-foot. (Figures are based on the average volume of water applied to produce a crop unit and market rates for each crop, less costs of production.)

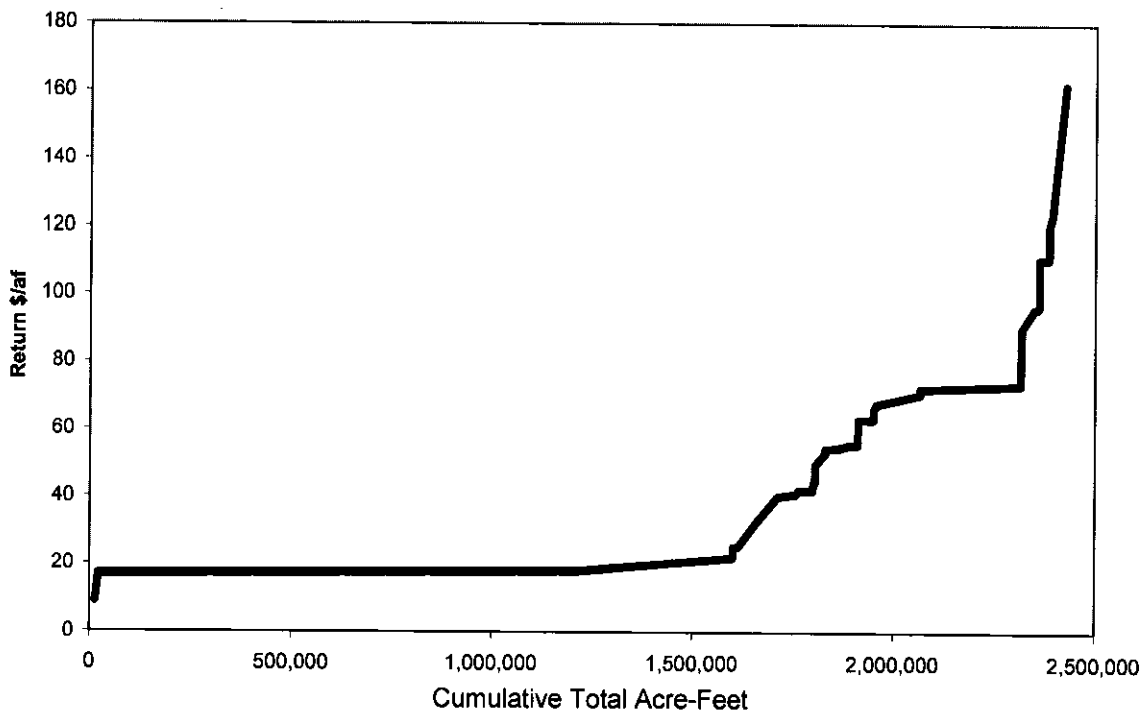


Figure 9. Profits per acre-foot returned on Colorado River water used in the production of selected crops in the Lower Colorado River Basin.⁹

While these figures do not necessarily reflect the amount at which any given water user would be willing to take part in a part-year fallowing program or agree to a dry-year option, they do suggest that if an open, market-based approach is used to identify potential participants, a number of water users in the Lower Basin would probably be willing to temporarily reduce or forgo the use of water for agricultural production in a price range between \$20 and \$100 per acre-foot (as the sale of water in this range would produce equal or greater monetary returns to the user than the use of water to irrigate crops).

In order to mitigate third-party impacts of fallowing, the federal government could establish a drought economic adjustment fund that would provide economic development grants to affected communities in the counties of origin. These funds preferentially would go to established county-based farm labor assistance programs to the extent that such programs exist, and could include lump sum payments to displaced workers based on a percentage of foregone annual income.

⁹ This graph has not been published elsewhere. For methodology, please contact Jennifer Pitt at jpitt@environmentaldefense.org. A study using similar methodology, but limited to crop values in the Wellton-Mohawk Irrigation and Drainage District, has been published previously (Pitt et al., *New Water for the Colorado River: Replacing the Bypass Flow*, 6 U. Denver Water L. Rev. 68 (2002)). The study found a range of prices similar to that represented here for profits derived from water use in that area.

Using these assumptions for water acquisition costs, Table 1 suggests the approximate range of costs for implementing each of the conservation triggers under the CBS policy.

Table 1. Approximate federal and power/water user cost of implementation of CBS policy conservation trigger levels (assumes that water can be acquired temporarily for \$20 - \$100/acre-foot, and that the annual federal bypass obligation of 110,000 acre-feet has not otherwise been satisfied).

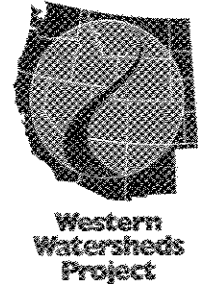
Trigger	Conservation required	Federal obligation (bypass + 50%)	Federal cost (millions)	Remaining Obligation	Water user cost (millions)	Power Surcharge (millions)	User cost per af (all Lower Basin users)
1075-1100	200,000 af	155,000 af	\$3 - \$15.4	45,000 af	\$0.45 - \$2.3	\$0.45 - \$2.3	\$0.06 - \$0.30
1050-1075	400,000 af	255,000 af	\$5 - \$25.4	145,000 af	\$1.5 - \$7.3	\$1.5 - \$7.3	\$0.19 - \$0.97
Below 1050	600,000 af	355,000 af	\$7 - \$35.4	245,000 af	\$2.5 - \$12.3	\$2.5 - \$12.3	\$0.33 - \$1.63

Cost of Not Implementing "Conservation Before Shortage" Policy

Although the "Conservation Before Shortage" policy would impose notable costs on water and power users, and on taxpayers generally, these costs should be compared with the much larger financial costs that would occur if the Secretary were to impose involuntary, uncompensated shortages, as well as the costs due to the lack of certainty and reliability that would exist without the CBS policy. The recent drought and decrease in power production at both Hoover Dam and Glen Canyon Dam point to the dramatic costs imposed by the loss of reservoir storage.

If Lake Mead falls to 1050 feet, power rates will need to be increased to an approximate composite rate of 2.31 cents/kWh, which is a 44.3% increase over current rates. Replacement power purchases would be (depending on the user) 2.9 to 3.7 times the Hoover rate. In FY03, replacement power may have cost customers an additional \$24 million.

Western Watersheds Project, Inc.
P.O. Box 280
Mendon, Utah 84325
435-881-5404 • utah@westernwatersheds.org



November 28, 2005

Regional Director
Bureau of Reclamation
Lower Colorado Region
Attention: BCoo-1000
P.O. Box 61470
Boulder City, Nevada 89006-1470

Re: Development of Management Strategies for Lake Powell and Lake Mead Under Low Reservoir Conditions

I have conducted research and studies on the Colorado River, its watersheds and wildlife, including the T&E species of fish endemic to the River System. I have noted the severe watershed damage from livestock grazing which created bare soil, accelerated erosion rates and depleted base flows in streams tributary to the Colorado River.

In recent years, as Utah Director for the Western Watersheds Project, I have been working to address watershed conditions on public lands including BLM and National Forests that ultimately affect the Colorado River. I find that these agencies are ignoring the role of their watershed and soil disturbing activities on the Colorado River System. They ignore the Colorado River Salinity Control Act in their project analyses.

You should be aware of the USGS studies in the 1970's by Lusby¹ which evaluated runoff and sedimentation when comparing grazed areas to those from which livestock were removed. The effects were dramatic.

Western Watersheds Project is requesting interested party status on your EIS and would like to submit detailed comments during the analysis process to ensure your management addresses watershed issues.

Yours truly,

John G. Carter
Utah Director

¹ Lusby, G.C. 1979. Effects of grazing on runoff and sediment yield from desert rangeland near Badger Wash in western Colorado, 1953-73. In: Hydrologic effects of land use, Geological Survey - Water Supply Paper 1532-I. U.S. Government Printing Office.

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November 29, 2005

Bureau of Reclamation
strategies@lc.usbr.gov

RE: Lower Colorado River Basin Shortage Criteria and Guidelines for Reservoir Operation.

Dear Sirs:

Thank you for the opportunity to provide scoping comments on the development of Lower Colorado River Basin Shortage Guidelines. The comments below are supplemental to the verbal comments I provided at the Henderson, NV scoping meeting.

This endeavor to develop criteria and plans for operation of the Lower Basin during times of shortage is a very important project with far-reaching implications. Based on the Bureau's projections for the future, the Colorado River will be in a condition of virtually permanent shortage as the Upper Basin States take more and more of their share of the River's flow. By definition, a shortage in the Lower Basin occurs when the Upper Basin is unable to supply the stipulated volume of water and the reservoir levels in the Lower Basin fall below a defined level. Hence, the Upper Basin States must be part of the discussion and the shortage plan. If, as projected, the future of the River is one of almost permanent shortage then the criteria and management plans you are developing will be the blueprint for management of River. This effort is much more than just a plan to regulate reservoir levels in times of shortage. Managing reservoir levels is really an exercise in managing downstream uses and demand for water. Although some will consider it heresy, the interests of society as a whole should be the paramount consideration, rather than the simple criteria of whose ancestors got to the courthouse first to file claims.

The final plan should be designed to minimize the long term negative impacts of decreased water deliveries. This might be best accomplished by providing for the sale, lease or trade of water rights among the seven States occupying the Basin. In this way any shortages will be voluntary, but with agreed upon compensation. I'm sure that established interests will be opposed to this idea, but it is already working on a limited scale in the Lower Basin and should logically be expanded to include the entire Basin.

The final plan should address the issue of alternative sources. For example, if water users turn to groundwater, especially that near the river or a tributary they are just taking the same water but through a different straw. If water is taken from basins which don't drain into the river then there will be impacts in those basins, which should be mitigated. In many instances groundwater is not a renewable resource and shifting from Colorado River water (a renewable resource) to groundwater (a non-renewable resource), merely delays a problem or shifts the problem to another segment of society and the environment upon which we all depend. Many will consider this suggestion to be beyond the purview

of this planning effort but I believe that the water needs of the West must be managed cooperatively and as a total system, not just one source at a time.

5

All legitimate stakeholders need to have a place at the table as the Plan is developed and negotiated. In addition to the seven States this would include the environmental community, which is concerned about the biological health of the River and its floodplain, as well as major power consumers who will be affected by changes in electric power output of Hoover and Glen Canyon Dams. I understand how difficult it is to deal with a large group of stakeholders and obtain agreement but it is essential in this case that it be done.

6

The presence of Las Vegas adjacent to Lake Mead and dependent upon the Lake for most of its water supply logically suggests that maintaining the water level in Lake Mead should take precedence over maintaining a given level in Lake Powell. The domestic water needs of a population of almost two million people, seems to me to be more important than the recreation values of boating on Lake Powell.

7

Sincerely,
John E. Hiatt
Conservation Chair
Red Rock Audubon Society
8180 Placid Street
Las Vegas, NV 89123
702-361-1171



ENVIRONMENTAL DEFENSE

finding the ways that work

February 1, 2006

Bob Johnson, Regional Director
Bureau of Reclamation
Lower Colorado Region
Attention: BCOO-1000
PO Box 61470
Boulder City, Nevada 89006-1470

via facsimile: (702) 293-8156

Re: Development of Management Strategies for Lake Powell and Lake Mead under Low Reservoir Conditions

Dear Mr. Johnson:

Environmental Defense has already submitted comments (along with several other organizations) regarding the development of Lower Colorado River Basin shortage guidelines, and this letter supplements our previous comments. Specifically, we are concerned that the Bureau of Reclamation is considering the initiation of multiple, independent NEPA analyses on numerous proposals for Colorado River management and mechanisms to develop "intentionally created surplus," including Development of Management Strategies for Lake Powell and Lake Mead Under Low Reservoir Conditions as well as Bypass Flow replacement, operation of the Yuma Desalting Plant, new regulatory storage facilities, forbearance agreements, and more, rather than evaluating these proposals collectively.

The language of the National Environmental Policy Act is clear. Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement (40 CFR 1502.4). To determine the scope of environmental impact statements, agencies shall consider... Actions (other than unconnected single actions) which may be:

- (1) Connected actions, which means that they are closely related and therefore should be discussed in the same Impact statement. Actions are connected if they:

- (i) Automatically trigger other actions which may require environmental impact Statements. (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously. (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.
- (2) Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.
- (3) Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement. (40 CFR 1508.25)

In order to assess fully impacts of the numerous and varied approaches to managing the Colorado River system in times of limited water supply, analysis under NEPA needs to compare the impacts of all available options, including coordinated reservoir management, shortage trigger elevations, and any actions taken to generate intentionally created surplus. Not only will the different mechanisms for intentionally created surplus water have very different costs and environmental impacts (and thus must be compared against each other and not in independent environmental impact analyses), but they can be expected to result in "savings" of different volumes of water. The volume of intentionally created surplus water will bear on the probabilities that water in reservoir storage will be within defined "bands" or shortage trigger elevations.

We recognize that management of the Colorado River system is complex, perhaps never more so than in times of water shortage. However, the stakes in the development of management strategies for Lake Powell and Lake Mead under low reservoir conditions are high, not only for water users, but also for the environment. We encourage you to ensure that analysis of alternatives under the NEPA is complete.

Sincerely,



Jennifer Pitt

Public Comment Forum

1 SALT LAKE CITY, UTAH, November 1, 2005, 6:00 P.M.

19 MR. WECHSLER: Good, we get the delight of spelling
20 my last name. Jim Wechsler, that's W-e-c-h-s-l-e-r.
21 And I'm with the Sierra Club, but I'm part of a group
22 that, Sierra is part of a group including Defender's of
23 Wildlife, Environmental Defense, National Wildlife
24 Federation, Pacific Institute, and the Senoras (sic) 1
25 that have already submitted a proposal called
1 Conservation Before Shortage. We're really pleased that
2 an EIS is being done, and with a complete analysis of 2
3 the cost and benefits and the environmental
4 implications.

5 We also think that the shortage criteria should be
6 crafted for the long haul, and implemented as a 3
7 permanent policy. The recent drought is quite possibly
8 only a preview of what's to come, given what we have
9 learned from the long term record of the Colorado River,
10 from what we know about long term drought periods in
11 North America which appear to be the orders of
12 centuries, and the probability of climate change to
13 reduce inflows over the next several decades. And I
14 don't know, is everybody in this room familiar with the
15 CBS proposal? Because there's no reason for me to
16 mention why it's good if everybody is familiar. All
17 right.

18 I've only got one page, so it's not bad.

19 The Conservation Before Shortage proposal is much
20 like some other proposals that are being considered by
21 the states. It has triggers at which point there would
22 be conservation within the lower basin. One of the
23 differences is that the conservation is to be sort of
24 prearranged voluntary conservation and compensated.

25 Monetary compensation for say a rancher who was
1 conserving water or a farmer. Some of its benefits are
2 reduced need for new water projects that introduces
3 flexibility into Colorado River management and will
4 allow those who are willing and able to reduce their
5 usage to be compensated for doing so and avoids needing
6 to impose restrictions in water use on those who cannot.

7 By eliminating the potential for water shortage is
8 when they cannot easily be accommodated. This policy
9 will limit the need for costly new projects. Of course
10 the point that's -- would cause a group of environmental
11 groups to come up with a proposal is we would like to
12 see protection for the environment. The fish wildlife
13 and natural areas on the Colorado do not, for the most
14 part, have their own water rights, they are last in line
15 for water. And they're the most vulnerable of all the
16 water users to a drought. The Conservation Before
17 Shortage proposal reduces overall water consumption in
18 dry years, decreasing the risk of shortage that can
19 disproportionately impact environmental uses in the
20 future, and also by increasing protection against
21 shortage for water users that have inflexible demands.

22 It will allow some water to stay there for the

23 fish and wildlife that need it to survive, and still
24 meet critical human needs. It improves power
25 production, consistent maintenance of the reservoir
1 storage and power head above baseline conditions in
2 average to low flow conditions. It will result in
3 increased power production, improve power revenues as
4 well as elimination of the risk if the elevations at
5 Lake Mead will drop below the minimum power head, and
6 thereby will improve the reliability of power
7 protection. It gives an increased certainty for water
8 users. And it will significantly reduce the likelihood
9 of involuntary and uncompensated shortages in the lower
10 basins at levels above 500,000 acre feet, which is the
11 approximate level at which a shortage exceeds the
12 ability of the Arizona water bank to buffer. I think
13 the Conservation Before Shortage proposal is interesting
14 because it offers an active anticipatory approach that
15 protects Colorado River water users and the environment
16 from abrupt reductions in the amount of water available.

17 The proposal would create a predictable rational
18 system for water users and distribute the costs between
19 water and power users and the federal government.

20 And finally, CBS, the Conservation Before Shortage
21 proposal, includes Mexican water users in the solution,
22 as they could be the ones conserving the water, and
23 thereby reducing the need for conservation among US
24 water users.

25 Finally, what's not in the typed up comments, is I

1 don't really expect our proposal to be adopted whole
2 cloth, but I think it's an example, has a number of good
3 things in it, is an example of the way we would like to
4 see this approached, and hope it will be approached, and
5 think that maybe when developing the alternatives it may
6 be worth it to take some parts from one set of
7 suggestions and some parts from others to make a final
8 plan.

1 JENNIFER PITT: Hi. I'm Jennifer
2 Pitt -- J-e-n-n-i-f-e-r P-i-t-t -- with
3 Environmental Defense, and I have a few comments.

4 First of all, a full NEPA analysis is
5 called for. I think we know that's coming. We
6 want to see a complete analysis of costs, benefits,
7 and environmental implications of each alternative.
8 Also, we'd like to see these shortage criteria be
9 enacted permanently. We think that permanent
10 guidelines really would meet the nature of the
11 scale of drought that -- the time scale that we're
12 dealing with, and we've heard suggestions that the
13 shortage criteria might be promulgated as
14 coterminous with the surplus guidelines, which I
15 think takes us out to 2015 or 2016, and I think
16 that's probably inappropriate given what we know
17 about projected water supply and demands going into
18 the future.

19 I also wanted to talk a little bit about a
20 proposal that Environmental Defense has developed
21 in cooperation with another -- a number of other
22 nonprofits. It's called Conservation Before
23 Shortage -- and I've actually brought a stack of
24 copies if anyone is interested. I think we've
25 already submitted it to Reclamation for

G-2012

1 consideration. I just wanted to describe it very
2 briefly and run through some of the benefits that
3 we see of this kind of approach to developing
4 shortage guidelines; and, specifically, this
5 Conservation Before Shortage proposal addresses the
6 need to look at how water is distributed in the
7 Lower Basin. It doesn't address some of the other
8 issues that Reclamation is seeking comment on right
9 now.

10 To give you a very brief description of
11 the program, it is a program of voluntary and
12 compensated water conservation where the volume of
13 conserved water is tied to lake elevations at Mead
14 and increases -- in other words, conservation
15 increases -- as water in storage decreases.
16 Funding for this program would be a combination of
17 federal outlays and fees imposed on water and power
18 users in the Lower Basin. So just quickly to run
19 through some of the benefits that we see of this
20 kind of approach -- and I have four main points to
21 make . . .

22 Number 1, this would reduce the need for
23 new storage projects. The introduction of
24 flexibility into Colorado River management would
25 allow those who are willing and able to reduce

G-2012

1 water use to be compensated for doing so and to
2 avoid the need to impose reductions in water use
3 for those who cannot. By eliminating the potential
4 for water shortages where they cannot easily be
5 accommodated, this policy would limit the need for
6 costly new water projects to protect water users
7 where they cannot tolerate interruptions in their
8 water supplies. I'm thinking particularly about
9 urban water users who are the juniors in the Lower
10 Basin.

11 Number 2, we think that there are some
12 benefits here in this proposal for the environment.
13 Fish, wildlife, and natural areas on the Colorado
14 River don't, for the most part, have their own
15 water rights. As such, they are essentially last
16 in line for water, and they're the most vulnerable
17 of all water users to drought. The Conservation
18 Before Shortage proposal would reduce overall water
19 consumption in dry years, decreasing the risk of
20 shortages that could disproportionately impact
21 environmental uses in the future. Also, by
22 increasing protection against shortage for water
23 users who have inflexible demands, it will allow
24 some water to remain in the river for wildlife that
25 needs it to survive while still meeting critical

G-2012

1 human needs.

2 Number 3, we think there's a benefit here
3 for improved power production. Consistent
4 maintenance of reservoir storage and power head
5 above baseline conditions in average to low-flow
6 conditions would result in increased power
7 production and improved power revenues, as well as
8 the elimination of the risk that elevations at Mead
9 would drop below the minimum power head, improving
10 the reliability of power production.

11 And, finally, and perhaps most
12 importantly, we think this proposal would increase
13 certainty for water users. Conservation Before
14 Shortage will significantly reduce the likelihood
15 of involuntary and uncompensated shortages in the
16 Lower Basin, particularly at levels of half a
17 million acre feet, which is the level at which
18 shortage exceeds the ability of the Arizona Water
19 Bank to buffer shortages.

20 Conservation Before Shortage offers a
21 proactive approach. It protects Colorado River
22 water users and the environment from abrupt
23 reductions in the amount of water available. You
24 know, it's hard to reach a consensus when someone
25 has to lose -- and this is really more a comment

G-2012

1 directed at Lower Basin water users. The current
2 deadlock between the states reflects a zero-sum
3 approach to river management, where one state or
4 one water user is expected to shoulder the full
5 burden of a drought by suffering a large and
6 uncompensated shortage, while others are
7 unaffected. Conservation Before Shortage suggests
8 a more cooperative and even-handed approach to
9 coping with drought. Conservation Before Shortage
10 would create a predictable and rational system for
11 water users and distribute the costs between water
12 and power users and the federal government. And,
13 finally, it could -- or we propose it could include
14 Mexican water users in the solution, thereby
15 reducing the need for conservation among U.S. water
16 users. Thank you.

17 (There were no further comments.)
18
19
20
21
22
23
24
25

G-2012

19 MR. CULP: Thanks very much. And thanks for the
20 opportunity to comment tonight. My name is Peter Culp,
21 spelled C-U-L-P. I'm an attorney with the Sonoran Institute
22 in Phoenix, Arizona. Sonoran Institute is a nonprofit
23 organization that works throughout the intermountain west on
24 issues related to land use and water policy.

25 I'm here today on behalf of a number of
1 nongovernmental organizations that are working on issues
2 related to the Colorado River. That includes Defenders of
3 Wildlife, Environmental Defense, the National Wildlife
4 Federation, Pacific Institute, Sierra Club, the Sonoran
5 Institute, and the Nature Conservancy. All of these
6 organizations take quite different approaches to the work
7 that we do on the Colorado River, but we've come together on
8 this issue because of the importance of the issue of
9 shortage sharing on the river. And we all recognize that
10 the combination of drought, the continued development of
11 uses in the upper basin, Lower Basin, and Mexico, and
12 potential climate change in the future mean that the
13 Colorado River has probably entered a new era of management.

14 As an initial matter, I just wanted to make two
15 comments with regard to the process that the Bureau is
16 undertaking and also the outcomes we'll be getting to.
17 First, we believe that a full NEPA analysis is called for
18 with the shortage criteria. That would include complete
19 analysis of the costs and benefits, environmental
20 implications of each, the alternatives that are to be
21 considered.

22 Secondly, we think that the shortage criteria
23 that the Bureau is going to be developed should really be
24 crafted for the long haul and should hopefully be
25 implemented as a permanent policy. The reason for that, as
1 I think we recognize that -- and I think we all need to
2 recognize, that the drought that we're in today is really
3 just giving us a preview of the situation which we're all
4 going to face in the future, particularly given what we
5 know, given the long-term hydrologic record of the Colorado
6 River and also the probability that climate change may
7 reduce the amount of flow that's available to water users in
8 the future.

9 With that said, the organizations I'm here for
10 tonight have been monitoring the discussions between the
11 seven basin states for some time, and although we are not
12 invited to participate directly in those discussions, a
13 number of us have a strong interest in them and began
14 meeting over this winter to try and develop an alternative
15 shortage proposal that we hope would be constructed for the
16 basin states process. We meet with reclamation staff
17 several times to review the results of the technical
18 modeling runs that have been done for the river using the
19 Riverware model, and Reclamation has quite generously
20 provided us some additional help in doing some modeling in
21 order for us to evaluate potential shortage criteria. All
22 that modeling work led to the development of a shortage
23 proposal that we're calling Conservation Before Shortage.
24 In essence, what the proposal does -- and I won't get into

25 excruciating detail here -- but it's basically proposing a
1 set of voluntary market-based reductions in Lower Basin use
2 that would be tied to specific tiers of lake levels in Lake
3 Mead. As originally modeled, the proposal was that around
4 1100 feet the Secretary would seek about 200,000 acre feet
5 of reduction in Lower Basin use through voluntary payments
6 to folks that forebear use of water; at 1075, 400,000 acre
7 feet; at 1050, 600,000 acre feet. And for argument's sake
8 we had assumed protection of 1,000 feet in Lake Mead with
9 involuntary shortages being imposed after that point.

10 What we were suggesting was that this mechanism
11 would be paid for via sort of a shortage mitigation fund
12 that would involve federal contributions plus surcharges on
13 water delivery and hydropower under low reservoir
14 conditions, the result being that, instead of having
15 involuntary shortages which would cause economic impacts to
16 folks that have inflexible demand, we would instead have
17 voluntary compensated shortages in advance of any
18 involuntary loss of water and hopefully achieve a sort of a
19 reduction in the probability of shortage, also delay the
20 onset of shortage, and limit the extent of shortage in order
21 to prevent any really significant losses in the Lower Basin
22 to Lower Basin users.

23 The detail of that proposal is in the comment
24 letter that we submitted in July to the Bureau. I've got
25 brought some extra copies of it today tonight if folks would
1 be interested. We're also in the process of developing a
2 slightly revised version of that proposal based on what we
3 learned through the Arizona stakeholders' process which we

4 will be submitting to the Bureau before November 30.

5 Regardless we're not really suggesting that the
6 precise numbers conservation levels or the lake levels that
7 we've suggested in the proposal are necessarily the right
8 ones. We're also not suggesting that protecting 1,000 feet
9 is the right decision or any other level. And note that
10 actually the Arizona stakeholder proposal includes a tiered
11 shortage strategy of their own which imposes progressively
12 larger shortages in the Lower Basin as need drops past 1075.

13 That may be the right way to administer
14 shortages. That's not what we're saying. The purpose of
15 what we're doing is really to suggest and hopefully
16 demonstrate some of the benefits that could be associated
17 with the inclusion of a voluntary market-based mechanism for
18 conservation as a part of a shortage strategy. And I hope
19 we make the case that such a strategy should be part of
20 whatever shortage criteria are ultimately adopted by the
21 Bureau.

22 There are essentially three primary benefits in
23 our view associated with doing a voluntary conservation
24 strategy in advance of imposing the shortage. Number 1, it
25 produces increased certainty for water users in the Lower
1 Basin because it significantly reduces the likelihood of
2 involuntary and uncompensated shortages in the Lower Basin.
3 It also allows potentially for the inclusion of Mexico in
4 that conservation strategy which reduces the need for
5 conservation among the U.S. water users.

6 Secondly, it creates some benefits related to

7 power protection because it allows us to maintain reservoir
8 storage in power head at higher levels than we would see
9 under average to low flow conditions. That essentially
10 eliminates the risk that Lake Mead drops below its minimum
11 power head and thus increases the reliability of power
12 production for the Lower Basin. Probably most importantly
13 it creates some increased flexibility in river management
14 because it allows those who are willing and able to reduce
15 water use to be compensated for doing so during low flow
16 conditions. And that has a couple of pretty important
17 benefits.

18 First, it avoids the need to impose reduction in
19 water use on the water users who have inflexible demands.
20 And by eliminating the potential for shortages where they
21 cannot easily be accommodated, that will hopefully eliminate
22 the need for costly new projects to be undertaken to protect
23 those folks that have those inflexible demands and thus
24 cannot tolerate any interruption in water supply.

25 Secondly, it protects a series of environmental
1 values because I think, as we all know, the fish and
2 wildlife and environmental values on the river don't
3 currently have their own water rights. As a result, they're
4 essentially last in line for water and are thus the most
5 vulnerable of all the users to the drought.

6 By reducing the overall water consumption in dry
7 years, we can decrease the risk of larger shortages that
8 will disproportionately hit environmental values throughout
9 the basin. And finally by increasing the protection for
10 folks that really have inflexible demand, particularly the

11 municipalities, we can reduce -- we can make it possible for
12 some water to remain in the river to provide the needed
13 support for those environmental values.

14 The overall intent is to provide sort of a
15 proactive approach that will protect Colorado River water
16 users and the environment from abrupt reductions in the
17 amount of water that's available. The states, as we all
18 know, are working very, very hard to try and come up with a
19 consensus proposal on shortage criteria, conjunctive
20 management, and other issues. I'd like to suggest though is
21 that's it's very hard to reach consensus when somebody has
22 to agree to lose. And I think in many ways the current
23 deadlock within the states about how to approach shortage
24 change may reflect in some sense that there is sort of
25 zero-sum approach in which someone is ultimately going to
1 bear the brunt of a large involuntary uncompensated
2 shortage.

3 Our intent is to suggest that maybe by
4 introducing some increased flexibility through the
5 introduction of the market mechanism that allows people to
6 voluntarily reduce use, we can create a more cooperative and
7 also predictable system for water users and distribute the
8 cost of the shortages between water and power users and the
9 Federal Government.

10 So anyway I do have a few copies of our original
11 proposal. There will be another one being submitted on or
12 before November 30, and I appreciate the opportunity to
13 speak tonight. Thank you.

1 HENDERSON, NEVADA, TUESDAY, NOVEMBER 8, 2005, 6:00 PM

17 MR. HIATT: I'm John Hiatt, H-I-A-T-T, and this
18 opportunity to address shortage criteria is an
19 historic opportunity to maybe relook at some of the
20 things that have been done on the Colorado River
21 system, starting in the 1920s.

22 The bureau's own projections suggest
23 that shortage will be the norm in the future on the
24 Colorado River, so therefore, what we are doing here
25 with addressing shortage criteria is really looking
1 at the future rules as to how we will divvy up the
2 Colorado River.

3 It's very important that we not repeat
4 the mistakes that were made in the 1920s, when it was
5 done originally, so this is really the opportunity to
6 do that.

7 One of the things that should happen
8 here is that the range of interests at the table
9 during these discussions should be expanded. In the
10 1920s it was only the states at the table. At this
11 point in time environmental interests need to be
12 included as well and there can certainly be
13 responsible environmentalists who can and would
14 participate in terms of the procedures and in terms
15 of deciding how the river should be divvied up. One
16 needs to look at the impacts on users, and that
17 includes wildlife, that includes every possible user
18 of water and decisions made that will have the least

1

2

19 permanent or long-term impact. That would mean in
20 terms of farmers, people growing wheat would be
21 shorted before people growing oranges or dates or
22 something that requires a long lead time to produce a
23 crop.

24 We also need to look at the impacts of
25 the shortage criteria on off-river resources because
1 one of the things that will happen is when water from
2 the river is not available, people will use ground
3 water and that ground water in some cases will come
4 from sources which drain directly into the river. In
5 other cases it will come from places which drain into
6 other basins, but we need to look at what will happen
7 when people go to alternative sources, and those
8 impacts may take place as much as, or more than 100
9 miles away from the river itself, but they are going
10 to be significant.

11 We need to look at the impact on some
12 of the minor drainages in the lower basin as a result
13 of what happens here in terms of shortage criteria.
14 That would be things like the Virgin River, the Muddy
15 River, and even as far away as the Amargosa River,
16 which doesn't connect in any way to the Colorado, but
17 ground water pumping to make up shortage on the
18 Colorado River system could dramatically impact that
19 very minor drainage, but one that is vital in its
20 land area.

21 In terms of management of the lake,
22 Lake Powell and Lake Mead, that's in some ways

23 relatively simple because it's really two big
24 interests there. There's recreation, power
25 generation. Wildlife interests are significant, but
1 not nearly as great. And there are certainly
2 mathematic formulas to figure out the most efficient
3 way to generate power between the two reservoirs to
4 maximize the amount of power generated.

5 Las Vegas is in a unique position in
6 this scheme of things because it's the only large
7 city on the river and it both takes water out of the
8 river and it puts effluent back into the river. So
9 therefore not only does it affect the river
10 volumetrically, but it affects it water quality-wise,
11 and that's very important.

12 So as we deal with shortage criteria
13 and less water in the river, water quality becomes of
14 greater and greater importance. Salinity, which has
15 been on the back-burner for the last two decades,
16 needs to come forward as a major. The more saline
17 the water, the more water is required for irrigation.
18 So it means that water used downstream will be less
19 efficiently used. So all of the upstream people who
20 put water into the river and all of the upstream
21 sources of saline water need to be examined so that
22 salinity and water quality are addressed as key
23 components in terms of river management. This was
24 started many years ago and essentially fell by the
25 wayside.

1 The other thing that needs to be looked
2 at is how states can trade water with one another.
3 This has been something which basically hasn't
4 happened until recently. There's still a number of
5 obstacles to the free trade of water between the
6 states, but in the final analysis as we are
7 addressing an over-committed river, we will have to
8 address how water can be traded between those who
9 need it, who need it most, and those who maybe can
10 find either other alternatives or can find that other
11 economic activities and other economic benefits, for
12 instance money, can be traded for water.

13 That's all.

1

February 21, 2006

Regional Director
Bureau of Reclamation, Lower Colorado Region
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Via E-Mail and Facsimile strategies@lc.usbr.gov and (702) 293-8156

Regional Director
Bureau of Reclamation, Upper Colorado Region
Attn: UC-402
125 South State Street
Salt Lake City, UT 84318-1147

Via E-Mail and Facsimile strategies@uc.usbr.gov and (801) 524-3858

Re: Colorado River Reservoir Operations: Development of Lower Basin
Shortage Guidelines and Coordinated Management Strategies for Lake Powell
and Lake Mead Under Low Reservoir Conditions

Dear Mr. Johnson and Mr. Gold:

The seven Colorado River Basin States recently submitted to the Department of the Interior a "Preliminary Proposal Regarding Colorado River Interim Operations." Before the Bureau of Reclamation (Reclamation) issues a scoping report in March, please consider these comments regarding the scope of NEPA analysis for Colorado River Reservoir Operations. Carrying all or part of the proposal forward as an alternative in the NEPA process will change the scope of Reclamation's proposed action as originally announced in the Federal Register. 70 Fed. Reg. 57322 (Sept. 30, 2005).

The Notice of Intent (NOI) stated that Reclamation was considering "(1) Specific guidelines that will identify those circumstances under which the Department of the Interior (Department) would reduce annual water deliveries from Lake Mead to the Lower Basin States below the 7.5 million acre-feet (maf) Lower Basin apportionment and the manner in which those deliveries would be reduced, and (2) coordinated management strategies for the operation of Lake Powell and Lake Mead." *Id.*

The Preliminary Proposal includes shortage guidelines and management strategies, but also includes recommendations regarding the Interim Surplus Guidelines and introduces new programs such as system efficiencies, extraordinary conservation and augmentation projects including tributary conservation, introduction of non-Colorado River System water and exchange

of non-Colorado River System water, and proposes the Intentionally Created Surplus program.

The scoping period is an “early and open” process for determining the scope of the issues to be addressed in the EIS and for identifying significant issues related to the action. 40 C.F.R. §§ 1501.7, 1508.25. Given the breadth and complexity of the Preliminary Proposal, Defenders urges Reclamation to reevaluate the scope of its proposed action to ensure that its environmental impact statement (EIS) encompasses the full suite of actions, alternatives and impacts. “Agencies shall use the criteria for scope to determine which proposal(s) shall be the subject of a particular statement. Proposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement.” *Id.* § 1502.4(a). If all or part of the Preliminary Proposal are connected actions¹, or if Reclamation carries forward parts of the Proposal that do not fall within the action proposed in the September NOI, Reclamation must prepare one EIS and must rescope.

We appreciate that Reclamation has set out a firm timeline for completing this NEPA process. Any delay caused by offering another opportunity for public input on significant issues and impacts triggered by the basin states’ proposal will be insignificant in comparison to delay triggered by introducing new actions or alternatives during the draft EIS comment period rather than the scoping period. Reclamation has put forth great effort in making its development of shortage guidelines an informative and open process – the very purpose of NEPA – and we encourage you to continue this effort.

Sincerely,

/s/

Kara Gillon
Staff Attorney

¹ “To determine the scope of environmental impact statements, agencies shall consider 3 types of actions . . . They include: (a) Actions (other than unconnected single actions) which may be: (1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements. (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously. (iii) Are interdependent parts of a larger action and depend on the larger action for their justification. (2) Cumulative actions . . . (3) Similar actions . . .” *Id.* § 1508.25(a).

**Friends of Lake Powell
P.O. Box 7007
Page, Arizona 86040
928 645-0229**

August 29, 2005

Darryl Beckmann, Deputy Regional Director
Bureau of Reclamation
Upper Colorado Region,
Attention: UC-402, 125 South State
Street, Salt Lake City, Utah 84318-1147

Subject: Colorado River Reservoir Operations - Development of Management Strategies for Lake Powell and Lake Mead Under Low Reservoir Conditions

Dear Mr. Beckmann,

The Friends of Lake Powell appreciate the opportunity to provide comments on the development of management strategies for the operation of Lake Powell and Lake Mead under low water conditions.

Our organization recognizes the importance of maintaining the existing water infrastructures along the Colorado River system and efficiently operating them for the purposes of complying with provisions of the Colorado River Compact, the Upper Colorado River Basin Compact, and the Mexican Water Treaty, while balancing the stakeholder needs of water, power, recreational and environmental end users.

The current drought, however, has underscored the vulnerability of the existing system and created the need to develop low water criteria so as to proactively conserve water resources and more equitably share the burden of drought between the two water basins, as subject to the limitations contained in the Colorado River Compact.

The desired end result would be the creation of objective operating criteria for 'surplus', 'normal' and 'drought' determinations at both Lake Powell and Lake Mead. The development of criteria based on lake levels would facilitate efficient and equitable reservoir operations, would improve stakeholder planning, and would minimize political posturing in the Annual Operating Process (AOP).

We encourage the Secretary of the Interior to seek increased operating flexibility for water storage resources along the Colorado River when shortage conditions are imminent.

Although the existing operating guidelines for Lake Powell and Lake Mead have functioned reasonably well over the past few decades, we note that inefficiencies do exist and that:

- A major objective of the 1922 compact was to provide for the equitable division and apportionment of the use of the waters of the Colorado River system.
- There are presently no provisions in place for equalizing the level of Lake Powell with Lake Mead during times of drought (subject to the provisions and limitations contained in the Colorado River Compact) even though equalizing the level of Lake Mead with Lake Powell during times of surplus is a stated objective in the long range operating criteria for the two reservoirs.
- The Upper Basin apparently receives no credit for water deliveries made in excess of 8.23 million acre-feet (maf) on a 10-year rolling average.
- The inflexibility of the minimum 8.23 maf water release schedule from Lake Powell potentially jeopardizes the interests of the Upper Basin during drought periods and, additionally, can fail to protect power and recreational interests at Lake Powell.
- The existing reservoir operating criteria have resulted in large fluctuations in the level of Lake Powell, which have created multi-million dollar impacts to recreational users, concessionaires, and resource managers.
- It is prudent now to develop proactive low water management practices to soften the impact of water shortages and more equitably share the impact of drought between the two water basins, as allowed under existing water contract obligations.
- New objective measures are needed at Lake Powell to minimize the risk of losing power generation and recreational access.
- The evaporative losses at Lake Powell are lower than Lake Mead

Therefore, we urge the Secretary of the Interior to consider new management strategies for low water ‘drought’ conditions. Specifically, we request the Secretary to:

1. Develop new reservoir management criteria that are flexible and responsive to variations in hydrologic conditions. 1
2. Develop annual Upper Basin water delivery schedules that uphold the flexible intent of the 1922 Compact and allow modulated releases less than 8.23 maf from Glen Canyon Dam during declared ‘drought’ conditions. 2
3. Define new operating criteria that equitably share the burden of drought between the Upper and Lower Colorado River basins and define objective criteria used to equalize the level of Lake Powell with Lake Mead during declared drought periods, for so long as provisions of the 1922 Colorado River Compact can be maintained. 3

4. Declare 'drought' conditions at Lake Powell whenever the water storage drops to less than 50% of capacity (3600' msl) at the beginning of the Water Year.

The importance of developing low water criteria and maintaining critical water levels at Lake Powell is crucial to reducing impacts for various stakeholders including:

- The CRSP power customers, who include over 200 different customers and power marketing entities
- The City of Page and their drinking water supply
- The Navajo Generating Station and their cooling water supply
- Resource managers and concessionaires at the Glen Canyon National Recreational Area
- Lake Powell recreational interests

Additionally, there are other considerations for maintaining the level of Lake Powell above the minimal power pool elevation:

- The Colorado River Storage Project (CRSP) Basin Fund would become insolvent.
- Environmental Projects – 756 NEPA and ESA decisions could be reopened.
- Problems associated with increased salinity discharge due to low reservoir levels.
- Compromises to the electrical grid system including 'black start' capability, restricted power imports due to inadequate voltage support, the need to replace regulated power and spinning reserve and the termination of the Salt River Project transmission exchange agreement

In summary, we support the creation of new and objective low water 'drought' criteria that would provide increased management flexibility and improved operating response to actual hydrologic conditions on the Colorado River.

Thank you for your consideration of these matters and the opportunity for public comment.

Sincerely,

Paul M. Ostapuk
Senior Board Member
Friends of Lake Powell